

University of South Wales



2060356

**An investigation of the factors involved in the development of
Pan European Financial Information Systems**

by

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A thesis submitted in partial fulfillment of the
requirements of the University of Glamorgan/Prifysgol Morgannwg
for the degree of Master of Philosophy

April 1998

The University of Glamorgan

To

My Parents, Brother, sister,
and her daughter named
Tselestina

Abstract

This thesis discusses the features of, and design issues involved in the evolution of Pan European Financial Information Systems (PEFIS).

The factors influencing the development and use of PEFIS are discussed in the light of current EU attempts to harmonize European accounting systems and implement single currency legislation.

An investigation of current market trends in this areas is presented and a criteria for assessing the development of such systems is proposed together with strategies for setting up the required development environment.

An extensive survey was conducted in order to discover the extent of PEFIS development amongst the major European software houses and these results are reported in this study.

Also an existing 'Pan European financial application' is analysed for compliance with the discussed characteristics of a PEFIS.

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Acknowledgments

I am most grateful to my supervisors, Mr. Duncan McPhee and Miss Claire Rees for guidance and help they have provided.

I would like to express my sincere thanks to Mr. Ian Thomson (Manager EDC, Cardiff, Chairman UK European Documentation Centers) for his valuable advice and guidance.


I would also like to express my eternal gratitude to Mr. Demetrie Jialli (Principal Lecturer, University of Glamorgan) for his support.

Thank is due to my family, and the husband of my sister Dinos Poulis who has supported me during these years of study.

Finally, I would like to thank all the staff of the University of Glamorgan, especially the technical department and all the people who made this thesis possible.

Author's Declaration

This Thesis has not been nor is currently being submitted for the award of any other degree or similar qualification.



.....

(Richard Michael Liatsos)

1. Introduction

The aim of this study is to demonstrate the feasibility of the Pan European software system especially when applied to the domain of financial information.

Paul Turner and Tony Jenkins (European Commission, 1995) were the first to define what constitutes a Pan European Financial Information System (PEFIS): *'A uniform Financial Information system that fully meets the standards and reporting objectives across the Members of European states, so that all assets and liabilities, revenues and expenditures or expenses, and the full cost of programs and activities can be consistently and accurately recorded, monitored, and uniformly reported to for control and management evaluation purposes'*.

A more simplified definition is used for the purpose of this thesis. PEFIS can be defined as : *A single integrated application, which may be implemented in multiple European countries without the need for amendment or modification. The local variations are implemented by means of parametrical features during the installation process.*

By definition a PEFIS must be more than just a national package translated into a foreign language with modification for the local VAT requirement.

The PEFIS must be also capable of meeting all the challenges of local legal taxation and financial/accounting requirements in an easy and flexible way as well as providing full multi-currency, multi-company and multilingual functionality.

The main concern is not only to define a PEFIS but also to address what PEFIS must ensure. A PEFIS must ensure:

- Consistency of accounting between European States (E.S.) entities

- Uniformity of accounting between the E.S.
- Increase the accountability and credibility of E.S. financial management.
- Improve performance, productivity, and efficiency of E.S. financial management systems.
- Monitor budget execution, financially and performance wise, including the regular reporting to the actual ECU and activities.

1.1 Objectives of this study

1. Define Pan European Financial Information System (PEFIS)
2. Identify the current extent of European software and services market in terms of market trends, software products, professional services and technology trends
3. Investigate the factors involved in the development and use of PEFIS
For instance investigate the E.C legislation effect in the development of Pan European Software.
4. Describe the features a typical system need to comply in order to be considered as Pan European e.g. the ability of the system to run in several machines from various vendors.
5. Develop a criteria to assess PEFIS development
Define the environment capable of supporting PEFIS development as well as outlines golden rules and guidelines for developing efficient and effective Pan European Software
6. Analyse a commercial Pan-European Software
Testing the compliance of SunSystem package, one of the most innovative designed accounting solutions with the developed criteria to asses PEFIS development.
7. Market analysis of commercial Accounting Firms

Circulate a questionnaire to a large number of European software development companies and consultants with the primary intention of collecting relevant information important to PEFIS design.

1.2 Demand

PEFIS existence is important in the light of the impedance of EU single currency legislation and the current subsequent attempts to harmonize European accountancy processes.

The pressure for PEFIS development comes from those who regulate, prepare and use financial statements multi-nationally.

Companies trade in more than one country want to unify their financial, logistical, administration systems by using a common system. EITO 96 survey shows clearly that software packages evolving at a rate of 20% compared to bespoke projects have a declining trend (European Commission, 1995).

Events, which may give rise for PEFIS, are often not just a need for accounting systems 'per se' but changes in the structure or objectives of an organization.

For example, the setting up of a new business in a new country with the consequent need for reporting to a foreign head office and producing consolidated accounts in a single currency, may cause an organization to consider pan-European solution.

Consideration may also be provoked by the acquisition of, or merger with a foreign company, again with the need for single currency consolidated accounts.

The demand triggers for existing multinational companies may be a desire for the rationalization in order to:

-
- Improve efficiency, including the speedier collation of management information or easier production of consolidated accounts.
 - Gain competitive advantage over other supplier in an increasing competitive market, by using technology to improve customer service and reduce the occurrence of lost sales.
 - Reduce cost, for example through gaining economies of scale.

A further demand for PEFIS may be the way business is done or a change in management reporting requirements, or finally a desire to improve the transferability of staff and rationalize their training.

Therefore, PEFIS may often be the “back office” part of larger systems which are being introduced to the business for more strategic reasons. In many situations financial systems will need to be sufficiently flexible to integrate with others “front office” applications which may vary from country to country or specifically written to a specific business need.

Some significant constraints in the development of PEFIS are:-

- Different Accounting practices
- Different legal issues
- Variety of languages
- Different currencies
- Domestic and foreign reporting
- Different Accounting systems e.g. Franco-German, Anglo-Dutch
Franco-German is an obstacle to movements towards accounting and auditing of an anglo-Dutch type and vice versa.
- Future planning and Investigation
Without consideration of the future trends in I.T Europe and of the many others' factors influencing PEFIS, development will be a real nightmare.
- Risk

Developing PEFIS certainly needs a lot of time and money. The most you invest the most you risk, and with all these uncertainties, proper investigation may needed first.

The EU wants to achieve as far as possible equivalence and comparability of financial information. By using a common system facilitates the management, equivalence and comparability of a European company. Single currency will help in terms of comparability and equivalence because everything will be expressed in one and only one currency.

There are many factors that are helping the development of PEFIS i.e.:

- Harmonization of accounting practices
- Single Market
- Increasing European Market
- Increasing movers towards package software
- Competition with R.o.W (Rest of World)
- Open systems platforms
- Single currency
- Many bodies working towards harmonization even though there is interference with current EU Directives. (E.g. International Accounting Standards Committee (IASC), International Federation of Accountants (IFAC), Federation des Experts Comptables Europeens (FEE)).

1.3 Example

Chameleon Package (Tetra)

Intergraph is one of the European leading manufacturers of graphics workstations and computer aided design and manufacturing (CAD/CAM) systems, with offices across the globe and annual sales exceeding \$1bn.

The company has strict reporting procedures for all its subsidiaries, each providing regular detailed information to the US headquarters. Intergraph set about standardizing its European accounting procedures to facilitate the gathering and processing of the necessary information. As none of the various systems in use at the time were suitable, Intergraph began evaluating appropriate accounting software. Their requirements were simple; they wanted a packaged solution that could offer good multi-currency facilities and would run under UNIX.

The company wanted to standardize on a system that it could operate throughout Europe and the Middle East, but which, in turn, could consolidate all the European information to provide reports to the US.

After initial evaluations with various software publishers, Intergraph finally selected Tetra's Chameleon package. All sites now run Chameleon financial ledgers, report writer and system manager modules, while some also run sales and purchase order processing and consolidation.

Chameleon is an Accounting Package available throughout Europe. It is available in English, German, Danish, Portuguese and Spanish. A Hungarian version will be soon be available. This system has been installed and is in use in approximately in 18 European countries. Chameleon offers good multi-currency facilities and flexible reporting facilities (Bruno Lamborghini 1997).

2. Factors influencing the development and use of Pan European Financial Information System (PEFIS)

2.1 Introduction

This chapter endeavours to address and to identify the current extent of European software and services market in terms of market trends, software products, professional services and technology trends.

The purpose is to obtain an accurate picture of the current trends of the market. To be successful and to maintain its competitive advantage, an organisation must constantly monitor events, trends, and demands in the economic, political, geographic, social and technological environment and their impact in software products, professional services and technology (Paul Turner, 1996)

Most of the information is taken from the European Information Technology Observatory (EITO). EITO is the establishment yearbook for the information and communications technology industry in Europe (ICT).

2.2 European I.T Market Review

1994 can be regarded as Year One of the emerging European Information Technology market for three reasons:

1. The presentation of the Bangemann Report on “Europe and the Global Information Society”

In the Bangemann Report, the key issue was the need for Europe to build a new type of society, the Information Society. The construction of this society was its ultimate goal. The information society is now a fundamental condition on which Europe’s survival as a competitive industrial area depends and on which further European integration and solid new economic growth depends.

1. The liberation of the telecom infrastructures and services;
2. And the build-up of a new wave of agreements and partnerships stemming from the convergence of the “4 Cs” (Germany, France, Spain, England).

The G7 Conference on the Global Information Society was held in Brussels in February 1994 this was to play a key role in stimulating debate on the regulatory harmonization of European financial systems and the creation of global competition. E.C Member countries have since launched new initiatives designed to speed up the implementation of the new infrastructures and services in a competitive environment.

“We have moved into an age where the information container (hardware, software, networks) is capable of being fully integrated with the information content (multimedia information). We have moved into a Global environment, where geographical borders and nationalities tend to vanish” (Pedro Schwartz, 1996)

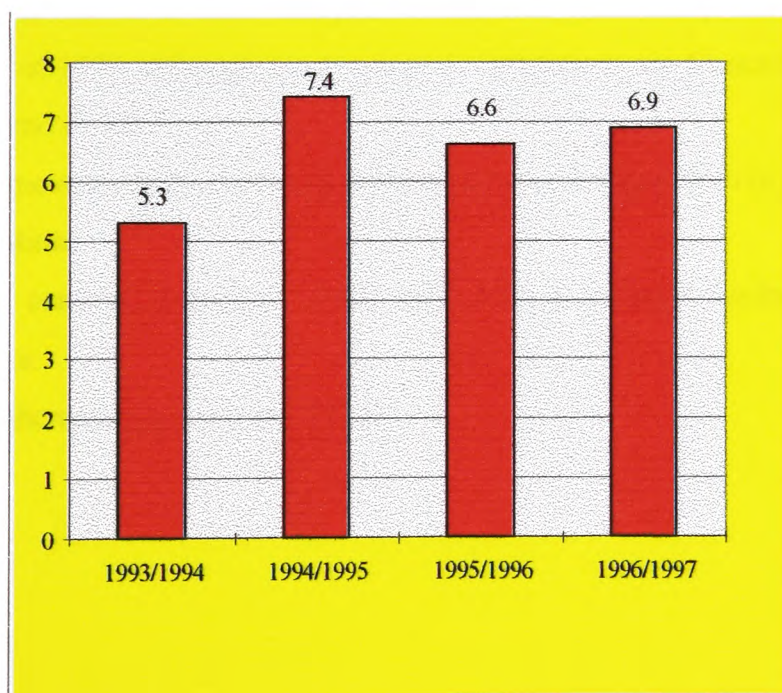


Figure 2-1: Western European I.T Market Value Growth Product Segment in %

Figure 2.1 shows the variance in the European I.T market growth since 1994. It is predicted that growth in 1997 will increase to 6.9% (European Commission, 1995).

The factors that determining present growth is:

- the continuing push of a client/server computing
- ongoing expansion of the packaged software market
- increasing moves towards external IT expenditures, such as outsourcing of data Centers and consulting.
- continuing demand for high-end PCs with multimedia capability
- increased telecommunications traffic
- new companies entering the telecommunications field.

However, these growth drivers have been hampered over the by the following negative forces:

- the slowdown in most European economies, particularly Germany, in the first half of 1996, although most economic institutions are forecasting a pick-up by the end of 1997.
- the move away from custom software to a more cost-effective packaged solutions
- The continuing decline of the traditional proprietary hardware maintenance business.
- the increasing price competition

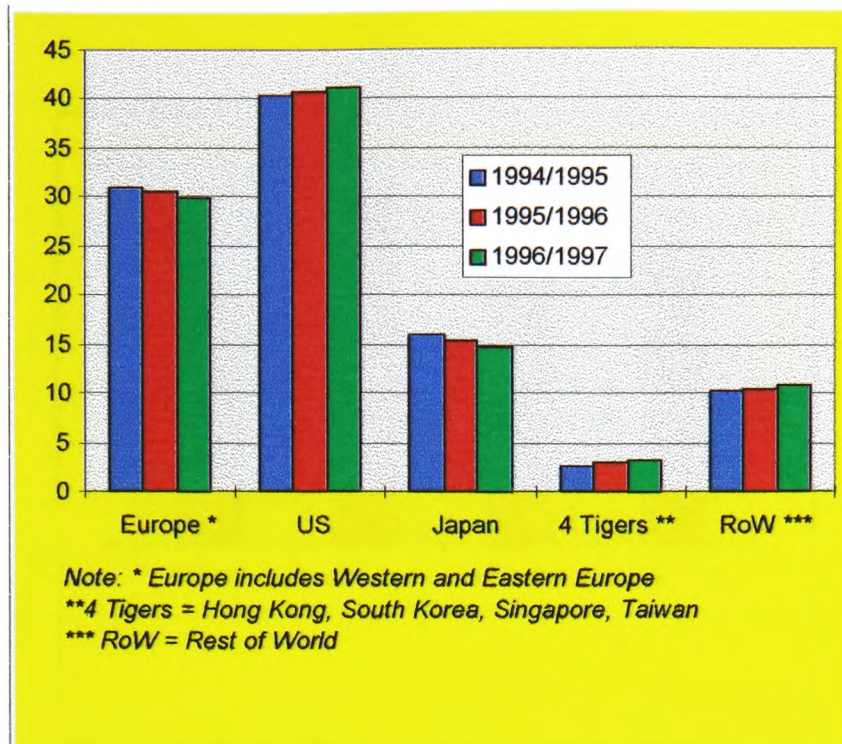


Figure 2-2: Worldwide LT. Market by Region: Percentage calculated on Market Values 1994-1997

Although improving, European growth rates still appear to remain lower than current worldwide trends, particularly in the IT market. Since 1990, Europe's share of the worldwide IT market has declined from 35% (1990) to 30% (1996). Worldwide, the IT market experienced double-digit rates of expansion in 1996 and this is forecast to occur again in 1997 (European Commission, 1994).

2.2.1 Software Products

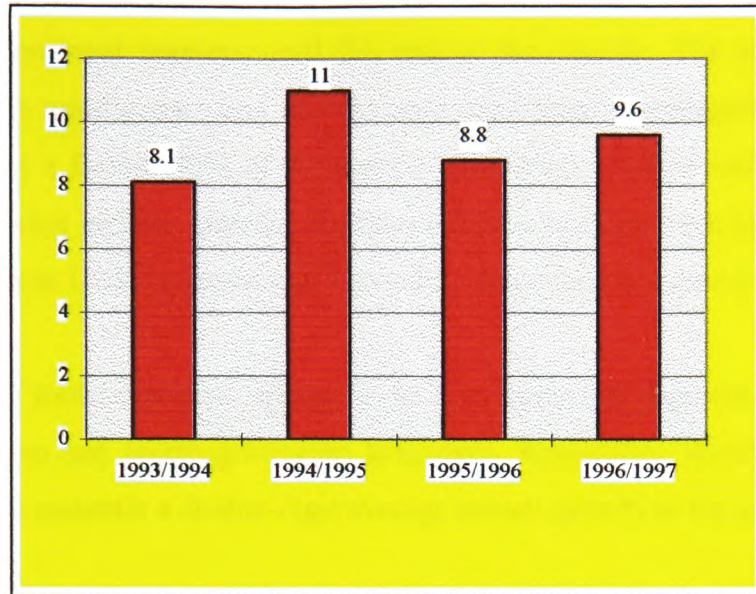


Figure 2-3: Western European Software Market, Value growth by Product Segment in %

The software products market continues to hold leadership among the growth drivers. In 1996 the growth of 8.8% of the European IT market as a whole outpaces the average of 6.6%. Although competitive pressure (especially in pricing) has continue to inhibit growth potential, forward momentum should push software spending to a predicted 9.6% growth in 1997 (European Commission, 1995).

Growth in the European software market is still continuing to be driven by application tools and solutions. In contrast, the current systems and utilities market has shown less dynamism (European Commission, 1994). The cost advantage of packaged software over custom solutions ensures higher growth in sales of packaged software options.

Distributed systems and Windows 95 continue to be the factors most likely to boost the packaged software market.

Operating systems account for more than 40% of this market and are likely to as remain the dominant segment until the end of the decade. The second largest segment is the middle-ware and utilities with performance management software accounting for a further 30% of the market. Operating systems and middle-ware are both showing healthy growths at present. These markets have been fueled by the movement to UNIX systems and the middle-ware need to support them.

In the area of tools, databases appear to be the largest sub-segment, followed by third-generation and fourth-generation languages. Application development tools are forecast to maintain a double-digit average annual growth to the year 2000.

Some of the strongest growth rate projections are for object-oriented technology. The market for object-oriented software was particularly strong in 1994 with +25% growth forecasts for database management systems, object-oriented CASE and object-oriented programming. Database management systems (DBMS) are predicted to grow at a rate of between 15% and 20% to account for almost a third of the tool's market .

In the applications market, accounting and word processing are the most important sectors of the market, followed closely by 'Edutainment' (Educational application e.g. Encyclopedia) and 'Infotainment' (Information application e.g. Flight information application, Train Traveling Times) consumer software. This market experienced growth in the 15-25% range in 1996 and this expected to remain at the constant in 1997.

2.2.2 Professional Services

The professional services outperformed the overall IT market by growing 8.6% in 1996, and an expected increase by 8.7% in 1997.

However there were major differences in growth rates both within the segment and between countries.

Growth in custom software was particularly flat, as companies increasingly demanded packaged solutions requiring customization rather than creating a one-off system.

IT consulting systems and network implementation, and education and training performed well, although growth rates for each of these segments are not expected to maintain the same sustained dynamics over the next few years.

The market for professional services was, and is still, subject to continued downward pressure on prices. Under increasing price pressure, the performance of the custom software market is relatively poor.

Growth in Europe's largest professional services market, Germany was average. IT consulting performed well, driven by growth in the Eastern German economy. The French professional services market has always been disproportionately large for the size of the country's IT markets. Growth last year was poor as custom software suffered from a lack of demand for external programming, companies preferring to employ internal IT professionals. (*See Appendix B*)

The Italian market was affected by reduced expenditure in several key vertical sectors. The manufacturing sector and central and local government all held back in their expenditure plans. (*See Appendix B*)

Amongst other countries, high growth rates in Sweden are solely the result of a small number of very large facility's management contracts while the Dutch market has suffered as a result of competition from packaged solutions and a fierce price war among the local service vendors. (*See Appendix B*)

2.2.2.1 Custom software

Custom programming represents the largest share of the European Professional Services marketplace. The European industry is still extremely fragmented as the level of the required primary human resources and financial investments are low. In countries like Germany, for example, the industry is composed of a large number of smaller developers often dependent on a restricted number of clients. The industry is expected to increasingly concentrate as users identify packaged solutions as more cost-efficient especially as they become more independent with good user interfaces and more powerful programming tools. Another important consideration in this area is the pricing.

2.2.2.2 Facilities management and outsourcing

Facility's Management and Outsourcing are among the fastest growing segment among all professional services, but they also represent certain market risk.

The development of the market is very uneven. The UK has by far the most mature market both in terms of its size and the maturity of users. It should keep its leading position as the public administration opens up to the FM alternative. The French market is rapidly evolving and the FM services industry is reorganizing at an accelerated pace. The German market is still one generation behind and is suffering from the relatively conservative attitude of large-sized user groups. (*See Appendix B*)

Globally speaking the trend towards outsourcing benefits a lot from the technological transitions experienced by users. For many user organizations managing the older centralized systems while developing and putting into place new architectures this is not an easy task as the lack of in-house skill and experienced resources, together with the necessity of migrating older applications onto newer distributed architectures, etc. are all factors which explaining the move to the use of external qualified experienced services.

Transition Management will represent a growing share of the European FM marketplace. There is a migrate towards distributed computing architectures and open systems. Managing this transition will be a task increasingly entrusted to qualified external partner. More users with a low-end IT culture and knowledge will move to client/server architectures (especially users from the desktop world using the Windows NT "channel") Consequently, more and more vendors will position themselves on the market using their technical ability to manage technological transitions.

The Network Facilities Management market is also showing important signs of growth and of reorganizations. A few major vendors (supported by niche providers in geographical markets) will survive. In order to survive a vendor must provide facilities like network Internet working, national network capabilities, strong service and support organization, flexible service alternatives and network management strategies.

In spite of its growth prospects, the FM marketplace includes some strategic risks. Many vendors have based their strategy on the provision of cheap processing power capabilities, however users are gradually acquiring cheaper and more powerful systems (workstations, distributed platforms....) which are gradually reducing the cost-advantage of processing-oriented FM services.

2.2.3 Technology Trends

Users' emphasis has increasingly shifted from hardware-related priorities to IT productivity and development issues, software technological evolution's have tended to acquire key roles in the European growth model. The increasing involvement of the end-user's community in development and data access activities, as well as the willingness to make efforts to increase returns of software investments, will help CASE and object-oriented technologies become privileged investment domains.

In parallel products will become technically increasingly integrated. The availability of open software platforms like Windows or UNIX, and of graphical user interfaces, enables a more efficient communication of products from different sources between them.

It is undoubtedly clear that the emergence of Open Framework causes rapid changes in technology.

An open framework is the combination of the use of standards (of various degrees of formality) for systems analysis and design, project management, IT services management, network and data management, with the use of technical standards for the procurement and integration of operating systems, data communications, Human computer Interfaces, Database Management Systems and application software components (Paul Turner, 1996).

In general open systems are supported to have the following characteristics: portability, interpretability and scalability i.e. solutions developed can run on a variety of networked machine from the bottom-end PC-based LANs right through to complex mainframe network architectures. These systems should also have a common 'look and feel' so that users used to running an application on architecture should find no (or very few) changes in running the same application on different architectures. A corollary is that all applications, over time, should

develop a common look and feel, so that user productivity is increased by removing the need to learn new interface styles of reach application they wish to use.

In order to advance knowledge of such open systems some of them are:

- a. Open Systems Interconnection Standards, a set of standards for allowing interpretability of machines across a variety of networks.

Seven - Layer model of interconnection.

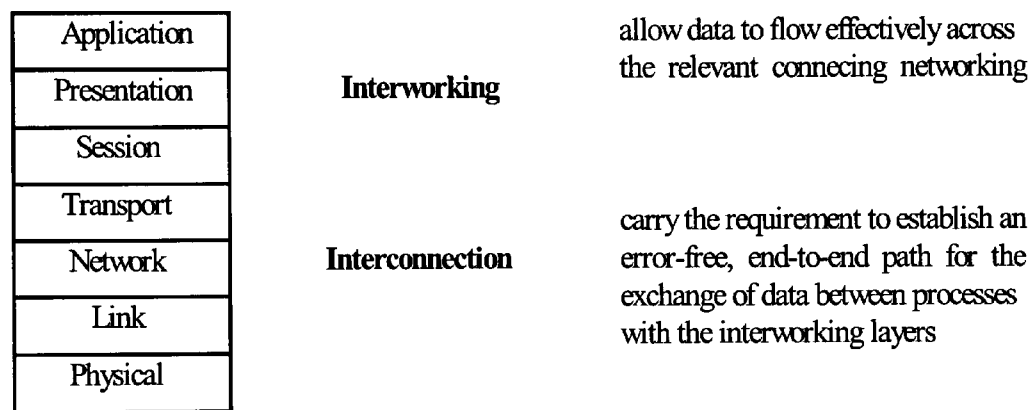


Figure 2-4: Seven model of interconnection

- b. Development at de facto standards for building complex client server architectures.
- c. Interment protocols, bared around the TCP/IP protocol set.
- d. Standards and approaches based around UNIX operating system architecture.
- e. The development of standards for Human computer Interaction, often now closely linked with standard for graphical user interfaces (GUIs).
- f. Standards for building and accessing databases.
- g. Development of standards to enable messaging applications to communicate with each other.

Purchasers enjoy much greater freedom of choice if they are not restricted to proprietary products from a supplier who is able to support the necessary interworking, but can select products from other suppliers that allow Open Systems Interconnection to TCP/IP based interconnection.

The trend now is to implement client server architecture with different types of computer - differentiated by their operating systems, their hardware infrastructures and their software - which have to be integrated into one system. Often some of the computers act as clients and have to access many different types of servers for data storage, program storage, control of shared devices such as printers, provision of communication links and for security. This is one of the main areas where open standards become important because integration between the PC client and the server machines has to be accomplished with the help of a network operating system, communication protocols, and local area networks (LANs) or wide area networks (WANs).

It is, of course, in the interest of some suppliers to attempt to provide a complete set of products, so there is no need to worry about openness when they can run on a variety of technical architectures. This is very much the ORACLE approach, which attempts to supply database software on hundreds of different machines running a variety of operating systems, including mainframe operating systems and UNIX. ORACLE then attempts to provide a set of tools to enable applications to be developed in a client server environment, including development tools for forms, for GUIs, for reports (and development support software including design tools, code generators and data dictionaries).

Open Systems are generally believed to have the following attributes:

- a. They have lower capital costs than proprietary close systems.
- b. They offer a wider choice of supplier (in the longer term, the more competitive market created will reduce upgrade and training costs)

-
- c. They ensure significant savings can be made through reduction in the cost of porting, new applications and systems. They reduce the need for retraining of personnel who move between organizations within the EU.
 - d. They offer possibilities for the coordinated management of systems.
 - e. They help to reduce application maintenance costs because the operating environment stays constant.
 - f. They offer the possibility of buying applications at cheaper price (an open market means a bigger market and subsequently economies of scale).
 - g. They reduce software license costs.
 - h. They provide improved facilities for communication and exchanging data and documents, thus creating more opportunities for integration and trading partners.

Business benefits of using standards-based framework:

- a. Standards achieve value for money in the use of both internal and external resources.
- b. Standards enable open competition in the procurement of systems and services in projects while safeguarding the return on the earlier investments.
- c. Standards improve the quality of information systems and services.

2.2.4 User Directions

As the price war becomes more intensive on the software products market, internal development departments are more and more competing against independent software providers. In a major user survey in the four main European countries (Germany, France, United Kingdom, Italy) it was found that around 44% of users expected an increase in their investment in packaged software as compared to only 9% expecting a decrease. The highest rate was found in the UK with over 60% of users surveyed reporting an expected increase in investments in packaged software.

This confirms the clear trend among users in choosing the most cost-effective solutions in their software decision-making process. At the same time, the clear benefit that packaged applications can draw from the crisis is exacerbated by the shift from mainframe-based and centralized DP systems towards client-server architectures and open systems. As users increasingly contend with distributed computing issues, they start realizing the critical added value as well as the supply of portable packaged applications.

In contrast, it seems that, although impacted by the price war, professional services are not drawing such a clear a benefit as packaged software is.

The attitude of users as far as their demand for services is concerned has to be analyzed in relation to their demand for packaged software. The percentage of users expecting an increase in their demand for services, though still high (36%) is consistently lower than for standard software. On the contrary, there are more users expecting a stabilization of their demand for Professional services (55% as opposed to 45% for packaged software).

However, traditional services, such as hardware support services, are acquiring a key position in users' demand. Organizations are trying to make most of their existing hardware base in spite of the availability of cheaper and more powerful hardware resources. The increasing complexity of hardware environments (distributed computing, networks, etc.) motivates important needs in hardware management support on the user's side. Confirming this, the already mentioned user's survey has shown that over 43% of interviewed users expected their demand for hardware maintenance services to be "heavy" in 1993; the highest rate was reported by Italy (49%). Only 11% of users anticipated a "light" user of hardware maintenance services.

Nevertheless, the outside delegation of responsibility over traditional internal MIS function seems to have some limits. The outsourcing of management and of the control over (part of) the IT is still a marginal phenomenon in terms of market

value. For example, in 1993 the European Facilities Management market worth 1.9 billion ECU's, that is to say only 7% of the total professional services marketplace. 75% of interviewed It users said they did not anticipate any use of data center outsourcing services and only 4% reported an expected "heavy" use of outsourcing services. These figures clearly show that users are primarily relying on internal resources to satisfy data center needs.

A very noticeable exception is the United Kingdom where nearly half of users are expecting some degree of use of outsourcing of data center services. This confirms the advanced stage of development of the UK FM marketplace as well as the difference in maturity of mentality reported on the British market.

In this context, hardware manufacturers have managed to take increasing share of services marketplace. 31% of users used their hardware vendor's integration as their primary provider of systems integration and outsourcing services.

It can be seen from the above that users will increasingly concentrate not so much on technology in itself but on returns of IT investments and in the development of a business. In this connection, services providers, and particularly those with capacity in management constancy, will be able to compete ever more effectively

2.2.5 Continuing growth in European Software and Service Market

Because of poor performance of the German economy as a whole, the IT market is expected to expand less fast than in previous years. The downsizing-taking place much of German industry at present appears to be having weaker effect on IT purchases compared to the present situation of the home PC market. The government sector accounts for a high proportion of the total French IT market and cuts in government expenditure are having direct results on the IT sector. Italy experienced strong economic and investment growth in the latter half of 1995, but

this was not reflected in IT expenditure. Spain, by contrast, experienced strong economic and investment expansion that was complemented by a surge in IT expenditure, although nominal growth was magnified by higher inflation.

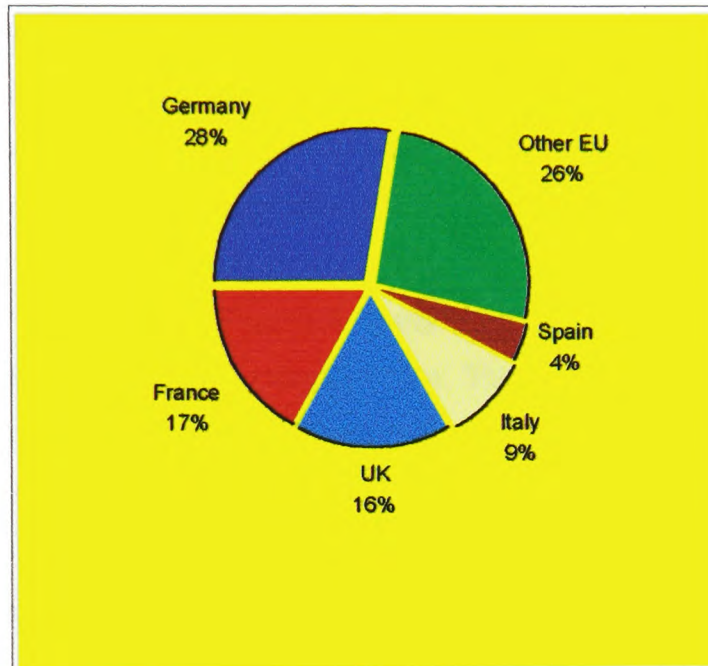


Figure 2-5: Western European IT Market by Country 1996

As a result of these differing dynamics, the market shares of the top countries are undergoing some readjustment. In 1996, the UK market will account for 15.9% of the total European IT market, up more than half a percentage point since 1993 at constant exchange rates. In contrast, France's share will have decreased to 17.2%, a fall of more than one percentage point. The German share of the IT market will be 27.0% (26.8% in 1993), while Italy will slip to 9.0% (from 8.8% in 1993) and Spain to 3.7% from 3.8% in 1993.

2.3 Banking Sector and Financial Services

2.3.1 Introduction

The banking sector is one of the most important components of the IT market in the EU, not only because it represents about 15% of the total IT market in the EU but also because of the importance of IT in the banking companies. The trend of IT expenditure is often higher than in other sectors.

The European Banking and Financial Systems are going through a period of structural changes and internal reorganization. The main EU banking trends in recent year can be summarized as follows:

- Reduction in branches and banking network reorganization
- Reduction of bank employees
- Mergers and acquisitions

The European banking market is larger than Japan and USA. In the EU there are more than 10,000 banks and about 170,000 branches. 1993 was a very important year for the European banking systems because the single market came into effect increasing competition between banking systems and single banks (European Commission, 1995).

2.3.2 European Regulations

In 1991, with the signing of the European Union Treaty in Maastricht, the Community made fundamental changes of historical importance in the institutional, political and economic sectors. The EMI, precursor of the European Central Bank (ECB), should put into effect the Maastricht plans for European economic and monetary union (EMU) with the ultimate goal of a single currency. This should have an important effect on payment systems and interbanking systems.

Banks in Europe are skeptical about prospects for achieving the Maastricht according to the scheduled timetable and are also concerned about the costs of single European currency. Until all the directives have been put into effect by all member states and potential members, there is no way of knowing how they will effect the business and profitability of banks.

2.3.3 The main strategic guidelines of European banks are:

- focus on *“the client”*: customer satisfaction, marketing systems
- focus on *commercial and sales* activities
- focus on *business management*
- focus on *investments and credit lending* areas
- *Payment systems* reorganization: in all EU countries automated payment systems and especially credit and debit cards are strongly increasing reducing cash payments and cheques.

2.3.4 The New Market Approach

Banking is increasingly being conducted away from the traditional branches: this is not to say that branches no longer have their place within the strategy of a financial institution but that new delivery channels (telephone, screenphone, PC, personal digital assistant, interactive TV, etc. are growing in popularity, especially with customers who like the “Wherever, Whenever and however” attributes of these service delivery media. But the new delivery forms also benefits the financial institutions themselves, which see potential cost savings and revenue generation associated with such offerings.

Phone banking is the most diffused. For some banks, this is the only alternative delivery medium that has been relatively successful, to date, for both the financial institution and its customers.

Telephone banks, branchless financial institutions that offer all their services by telephone, have also been growing rapidly in Europe as subsidiaries of some of the larger institutions in the market.

Other new media are self-service and home banking. Home banking, which is based on a PC link between banks and clients, at present, is most diffused among corporate clients.

This is significant because “direct” banking is changing the business model of branches and consequently their organization and technological solution.

Because of new services, branches are changing. In summary, we can say that:

- Banks are investing in branches also in countries, such as France, where home remote is important.
- The area of consulting is becoming increasingly important. The consulting area must be equipped with workstations capable of performing all the usual transactions but also new business intelligent operation.
- Branches are becoming more independent and they are currently starting to be managed like small or medium-sized enterprises, leading to the development of new activities such as: global and local business information, management of business assets, assistance of sales and simulation and follow-up of the local decision.
- Branches are becoming more independent also from the technological point of view, with client server architectures, local databases and applications, new technology, etc.

2.3.5 The Key Role of ICT in Banking

Banks are changing from an organizational and business point of view. These changes have an impact on the organization of ICT, on the architecture, and on the software applications.

The transforming of banks into “business companies” and the customers-oriented strategies are changing the banking organization and consequently the role and structure of IT. The new key issues are “communications” and applications “integration” in order to:

- Provide banks with business management tools (planning and control risk management, etc.)
- provide banks with marketing and sales tools
- Provide banks with new delivery channels in order to complement the traditional bank/client relationship with “direct” channels based on telecommunication technologies (telephone, call centers, on line Personal Computers, self service equipment’s, etc.)

Banks evaluate that the importance of ICT is increasing although the already very high ICT intensity.

2.3.6 Present Architecture and Trend

European banks have now clearly identified the client/server architecture as the best ICT system configuration. This almost always means integrated multivendor environments with the host acting as a centralized database and controller for a range of transaction-intensive applications.

2.3.7 Hardware Equipment

About 1,500 large systems are installed in banks in the EU. This represents a significant number of the total EC installed base and is due to the traditional centralized systems in banks. As already stated, banks are moving towards

client/server solutions. This does not seem, in many cases to eliminate large systems, but to a large extent, to change their role. The only country with significant experiences of downsizing is the UK.

	Large	Medium & small systems	Workstations	PCs
France	210	19,000	14,000	400,000
Italy	200	15,000	6,000	290,000
Germany	490	28,000	26,000	700,000
Spain	110	8,600	4,500	165,000
UK	270	20,000	17,000	450,000
Others	220	19,400	8,500	295,000
Total EU	1,500	110,000	76,000	2,300,000

Table 2-1: IT Hardware Installed Base in Banking Sector in the EU (Units 1996)

Medium and small computers play an important role: they are traditionally host computers in the smaller banks, but they are servers in the emerging client/server architectures in the largest branches and banking departments. It was estimated that more than 100,000 mini and small systems installed in banks in the EU.

Finally is very important to analyze workstations and PCs. It was estimated about 76,000 workstations and 2,300,000 PCs in banks in the EU.

2.3.8 Information Technology Expenditure

In recent years the banking IT market has experienced higher growth than global IT market. This is due both to the lower impact of the economic crisis on the banking system than in other sectors and to the increasing importance of ICT in the banking industry.

ICT is considered a competitive advantage by a large majority of banks and a recent survey presented by the Italian Banking Association showed that higher ICT investments allow banks higher profits and market shares.

Higher expenditure combined with more computerization has translated into higher growth in the UK compared with other banks in the EU. Financial constraints in the last two years have led to cutbacks in Italy.

In all the countries the cost of software and services is higher than the cost of hardware. However, hardware expenditure is comparatively lower in France, Italy and Germany (about 30-35%) and higher in Spain and the UK (more than 40%).

The gap between the two components is rapidly increasing due to increasing investment in software and services.

2.3.9 Emerging Applications

In European banks there is a very high number of projects (present or planned), to provide adequate application and technological solutions to new “emerging bank”.

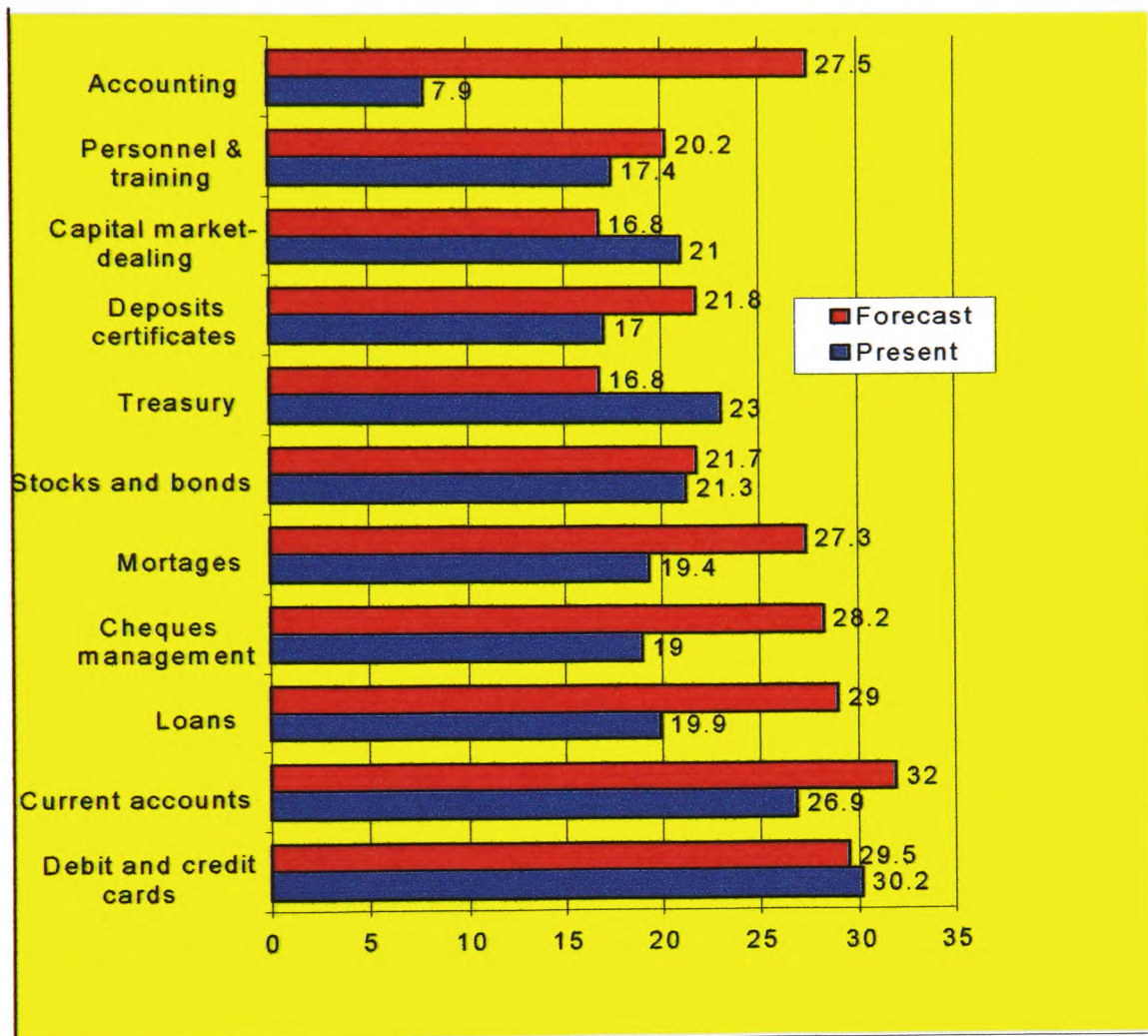


Figure 2-6: The Financial application software projects EU Banking Sector (% of banks)

European banks are investing most heavily in:

- Branch-front office, credit risk, customer info Database, document processing
- Credit cards, loans and mortgages, stocks and bonds and insurance's, direct marketing, investments and financial consulting, management and control systems and financial risk.

- Cheque management, product information DB, sales tools, personnel and training, profitability analysis, home and phone banking.
- *new technological architecture and platform*, global information system review, document processing - optical technology - OCR systems, banking network improvements, e-mail, new development (object oriented) approach, Datawarehouse, new DB structure, application software integration
- *new delivery channels*: phone banking, self-service machines, home and remote banking
- investments: new more sophisticated and complex financial products. Example: integrated investment funds and insurance, etc.

2.3.10 New Banking Requirements

Generally speaking, banks are moving from a totally in-house development of software projects towards joint development and the acquisition of products-services on the market.

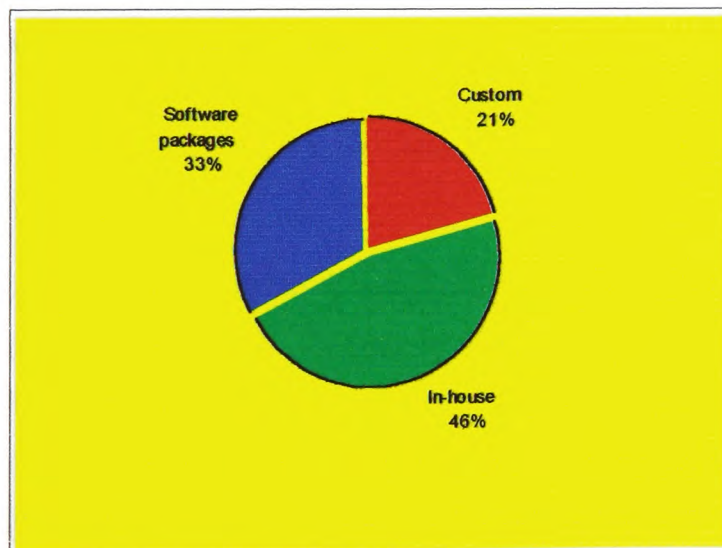


Figure 2-7: Present Projects Development Modes

Situations of total outsourcing in project management are rare, given banks' desire to retain control and independence over information technology, which is considered an increasingly strategic support tool for any market strategy or internal reorganization process.

	Project development	Data Processing Center management: GLOBAL OUTSOURCING	Data Processing Center management PARTIAL OUTSOURCING
FRANCE present situation trend	LOW stable	LOW stable	LOW decreasing
GERMANY present situation trend	HIGH stable	HIGH stable	MEDIUM stable
UK present situation trend	MEDIUM increasing	MEDIUM stable	HIGH increasing
ITALY present situation trend	MEDIUM increasing	HIGH increasing	LOW increasing
SPAIN present situation trend	LOW increasing	LOW stable	HIGH stable

Table 2-2 Outsourcing in European Countries

The main reasons for the trend towards more outsourcing are:

- Weak markets and costs
- lack of internal resources, inadequate internal skills and availability of suitable products-services are the main reasons for acquiring specific products and services on the market.
- skills and costs are the main reasons for joint projects choices. Joint projects allow banks to acquire knowledge from partners in order to become more independent in application solutions management and improvement.

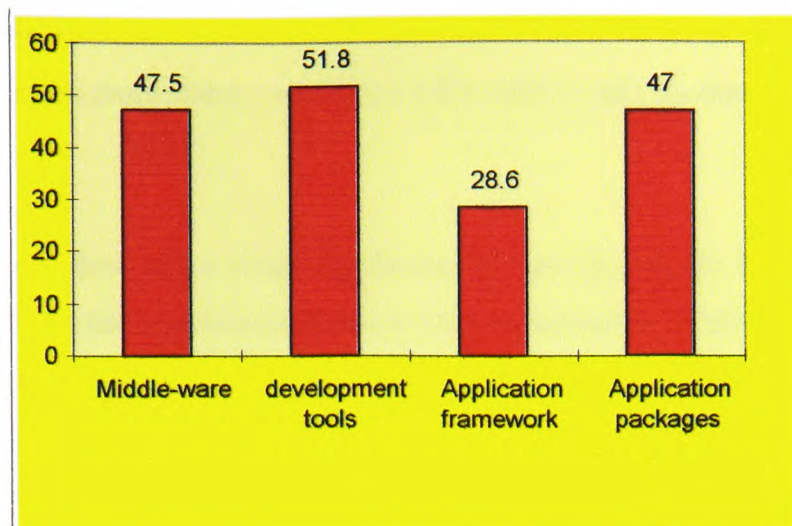


Figure 2-8: A new demand of products (% of projects)

The market trend shows also change in the products and services required.

- more than 50% of projects are based on development tools
- nearly 50% on more traditional application packages
- more than 40% on middle-ware
- nearly 30% on application frameworks(kernels)

Application development tools are decidedly more important in the UK and France (about 70%) and Germany (60%); middle-ware is very important in France and Germany (about 60%); application frameworks are more important for Spain (54%) followed by Germany (37%) and the UK (26%).

The highest demand is for ICT consulting in professional services.

2.3.11 Types of providers

Banks in the EU look for suppliers who will act as partners and work with the bank to build customized solutions. This means suppliers have to become problem solvers and move beyond the traditional sales approach designed to achieve

maximum results immediately, which too often fails to take account of customers' real needs.

Banks prefer to deal with a single supplier per project in order to facilitate project management and coordination, and ensure greater commitment from the supplier.

A guarantee of greater independence is the main consideration for banks that prefer to use more than one supplier (for example in France).

Analysis of suppliers in banking projects reflects typical high fragmentation of the application software market. Only a small number of suppliers are mentioned by more than one bank (31%, out of the all suppliers named) and the number of suppliers present in at least two countries is even smaller (about 20%).

2.3.12 Buying criteria

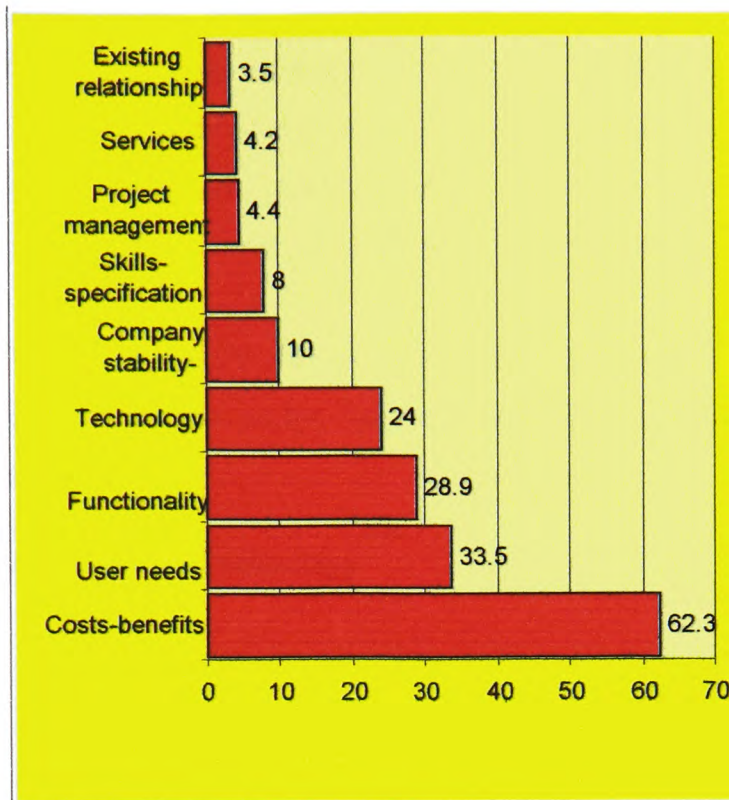


Figure 2-9: Buying Criteria (% of Banks)

The main criteria in choosing providers and solutions by Banks are:

- *Cost-benefit assessments* are the chief factor in the choice of development methodologies, market suppliers and solutions
- *The functional adequacy of solutions*: the match with banks' business models; the ability to support business, image and marketing strategies; and alignment with the requirements.
- *Technological characteristics*: technological compatibility is a significant factor taking into account the characteristics of the existing ICT system (very often, projects have to integrate new developments with existing applications) and current innovation and change; solutions must also guarantee easy implementation, platform independence (support for upgrades, standards, open systems) and flexibility.

-
- *Supplier characteristic.* The supplier is required to guarantee stability, reliability and the dimensions to handle projects of a certain importance; the supplier must also be proven expert (good positioning in the banking market), a specialist, offering skills and professionalism, adopting a problem-solving approach. Previous experience and a good relationship with the bank are also taken into account.
 - *Services.* Quality of support services, prompt delivery (or ability to meet deadlines), ability to interact in the bank environment with the various areas involved in the project.

2.3.13 Infrastructure and Technology

Europe does not have its own information superhighway infrastructure: the building of a standardized, European-wide infrastructure will probably not be achieved until after 2000. In the meantime, the Internet is fast gaining in popularity as a stopgap solution, especially for business users.

Also Europe does not have widespread asynchronous transfer mode (ATM) technology to facilitate the high-speed transmission of the large amounts of multimedia data. Some limited broadband networks exist in some countries used chiefly by a few large corporate users. Integrated Services Digital Network (ISDN) is becoming widely available, but few information service providers offer ISDN access. Cable television is widely available in only a few countries.

2.4 Conclusion

It is apparent that European Information Technology (I.T) market is increasingly evolving with a predicted growth of 6.9% in 1997-98.

Operating Systems and accounting applications remain the dominant segments in the software product arena. The migrate towards distributed computing architectures and open systems increasingly entrusted to qualified external partners. There is a trend more and more vendors to position themselves on the market operating in the technological transition.

Open System (Protocols, TCP/IP) characteristics (portability, scalability etc.) develop a combination of standards that foster applications over time to develop a 'common look and feel'.

This Chapter also discusses and stresses the key role of banks in the ICT. It also shows the trends of banks concerning I.T and what infrastructure and technology are looking for.

3. Single Currency

3.1 Introduction

Every organisation success depends on how well fits to its environment. The move to the single currency will impact upon the daily lives of hundreds of millions of consumers and citizens, tens of millions of firms, particularly on their accounting systems, and all public administrations, financial or otherwise.

Companies can not stay idle. Those able to identify what effects they are going to face and the way to solve them are going to gain a competitive advantage over others.

This Chapter addresses the importance of Single Currency and its effects in the payment system, financial market and accounting packages.

“The single currency is just around the corner, and it looks as if Europe is finally waking up to the fact” (EMU, 1996)

In less than four years, European Monetary Union (EMU) will be a reality. The time has come to launch the final stage of the preparatory work and to determine together with all players involved how to prepare for the introduction of the single currency. It is not a matter of “who” will take part and “when”, but “how” this will happen.

The single currency should ultimately cover the entire single market. New members of the Union must also comply with the relevant provisions of the Treaty of European Union. Not all Member States will have achieved a sufficient degree of economic convergence by the time EMU starts. These countries that do not

meet the criteria from the outset will fully participate in all the procedures designed to facilitate their future participation (Ferland Herman, 1995).

Economic and monetary union is the central commitment of this Treaty that aims to consolidating peace and prosperity that, from the outset have been the prime objective of the construction of Europe.

The Treaty

- is designed to establish the single currency as one of the most stable currencies in the world
- establishes economic monetary decision making centers that are strong and balanced.
- Lay down a precise and realistic timetable to achieving this goal.

EMU is built in two foundations: a strong focal point for the coordination of economic policies (the Council of Economies and Finance Ministers) and as independent monetary institution (ESCB). The Council of Economics and Finance Ministers is responsible for defining the broad guidelines of economic policy; it has the means at its disposal to apply pressure on participating countries to meet their budgetary commitments. The European System of Central Banks (ESCB), which brings together the central banks of the Member States and the European Central Bank (ECB), is independent. The ECB freely determines the Union's policy and its task is to guarantee price stability.

For monetary union to be credible and strong, it must encompass only countries that are well managed economically. To this end, the Member has undertaken to improve the performances of their economies to match those with the best track record. This is the concept of convergence. In order to assess whether the degree of convergence is sufficient the Treaty sets out the rules of good management that must be followed (Green Paper, 1995).

In the last few years, the unacceptable rise in unemployment, the difficulties caused by recession and the excessive or unwarranted fluctuations on foreign exchange and capital markets have impaired progress towards economic and monetary union in Europe. Certain sectors of public have been seized by doubt. In economic and financial circles, the desirability, credibility and feasibility of the single currency have been questioned.

Available poll evidence, show a declining belief among the population in all Member States (except Sweden, Finland and Austria) that a single currency will be in use by the 2000. In June 1991, 64% thought so. By June 1994, only 51% believe in the prospect - a slender overall majority (Green paper, 1995). In Denmark, Germany, Greece and UK, believers were in a minority while they were exactly 50% of the sample in Portugal.

Other poll evidence shows very high proportions (more than a third of Europeans) never having heard of the ECU and strong resistance to its use as a single currency in Austria, Denmark, Germany and UK. Just over half of all responders want to know more about its advantages.

Those able to identify advantages thought that it would benefit companies most and strengthen Europe in global competition. Just over 46% thought that ECU would help to deal with future economic problems. (Green paper, 1995)

This is the purpose of the Commission's Green Paper, the Maastricht Treaty, the Taylor Plan and the convergence reports: to help foster among Europeans a pride in their currency and to encourage them to play a full part in making it a reality.

When will be the final changeover to the Single Currency?

It would last as long as necessary to complete the physical replacement of national notes and coins. It would mark the completion of the introduction of the single currency and involve the following developments:

- notes and coins are exchanged
- only the ECU is legal tender
- the changeover of the banks and the financial system is completed; all means of payment (transfer cheques, cards) are converted into ECU in conjunction with the domestic settlement systems.
- the private no-bank sector conducts all transactions exclusively in ECU.

Five-year countdown to monetary union:

1997: Qualification of membership of EMU depends partly on national economic performance - size of budget deficit and total national debt - in this calendar year

1998 (no specific date set): Decisions must be made on who wishes to join economic and monetary union and who qualifies, based on early indications of national economic performance in 1997.

1 Jan 1999: Economic and Monetary Union begins, National currencies remain in circulation but exchange rates between ECU members are fixed.

1 Jan 2002: The Euro, the single European currency, enters circulation. National currencies survive, in parallel with the Euro, for another six months

1 July 2002: Old national currencies in EMU member states are no longer legal tender. The Euro takes over.

3.2 Maastricht Treaty & Delors Plan

The extensive debate and intensive negotiations that followed the publication of the Delors Plan eventually led to the Maastricht Treaty agreed upon by EC member countries in December 1991. The Treaty addresses a number of issues, which Delors Plan either failed to consider or opted to consider. The latter recommended a three-stage process towards the creation of the European currency union but refrained from suggesting a timetable for the completion of the process and the formation of the union. It simply stated the process should begin on 1 July 1990. The Maastricht Treaty, in line with the Delors Plan, provides for a three-stage process leading to the complete monetary unification of the EC, but it also stipulates a well-defined timetable for the establishment of the second stage. Further, it stipulates that during 1996 the European Council will determine whether a majority of EC member countries qualify for the union membership and, if this is the case, will set a date for the union to become operational. Thus the earliest date for the establishment of the currency union is 1 January 1997. If there is no such majority at the time, then the union will come into effect on 1 January 1999, even if only minorities of member states satisfy the membership conditions. It follows, therefore, that no member country can veto the establishment of the currency union. But even more significant is the implication that the Maastricht Treaty is perfectly consistent with the emergence of a 'two-speed' Europe, if that is the outcome of either economic conditions or the political wishes of one or more member states. The Maastricht Treaty allows both the UK and Denmark to opt out of the monetary union even if they satisfy the membership conditions (Ferland Herman, 1995).

The Maastricht Treaty specifies the criteria of convergence that had to be satisfied for a country to qualify for membership of the currency union. According to the Treaty an EU member state must satisfy the following conditions:

1. its inflation rate must be no more than 1.5 per cent above the average of the lowest three inflation rates in the EMS;

2. its long-term interest rates must be no more than 2 per cent above the average of the lowest three member countries' rates;
3. it must have maintained its exchange rate within the narrow bank of fluctuation of the Exchange Rate Mechanism (ERM) of the EMS for at least two years; without a realignment;
4. its budget deficit must be no larger than 3 per cent of GDP;
5. its National Debt must not exceed 60 per cent of GDP;

These convergence criteria can be judged to be stringent, particularly in their implications for the fiscal policies that need to be pursued during transition period towards the establishment of the monetary union. Whether this degree of stringency is necessary and whether the implied level of monetary and fiscal convergence is politically feasible within the timescale prescribed by the Maastricht Treaty are issues that nobody can be sure it.

3.3 Economic Convergence in the Union 1996

The European Commission in November 1996 adopted a report to the Council of Ministers on progress by Member States with economic convergence in view of their participation in the Euro. This report concludes that substantial progress has been made in most areas, in particular controlling inflation, exchange rate stability and convergence of long-term interest rates since the start of stage 2 of monetary union on 1 January 1994 (Davis, 1996). While there have also been improvements in national budgetary situations, further progress needs to be made. The Commission's analysis is fully in line with the European Monetary Institute's report on economic convergence adopted on 5 November 1996. In the light of the two reports, the Commission has adopted a recommendation to the Council for formal confirmation that the third stage of Monetary union will not start in 1997, since a majority of member states do not meet the necessary conditions. Following the conclusions of the conclusions the Euro will therefore be introduced on 1 January 1999 (European Monetary Institute, 1996).

The main conclusions of the convergence report are as follows:

- ten countries have an inflation rate below the reference value (Belgium, Denmark, Germany, France, Ireland, Luxembourg, the Netherlands, Austria, Finland and Sweden)
- eleven countries meet have long-term interest rates below reference value.(Belgium, Denmark, Germany, France, Ireland, Luxembourg, the Netherlands, Austria, Finland, Sweden and the UK);
- there are eleven countries participating in the exchange rate mechanism of the European Monetary system of which nine have been members for over two years (Belgium, Denmark, France, Spain, Ireland, Luxembourg, the Netherlands and Portugal. Austria joined the system at the start of 1995 followed by Finland in October 1996.
- al except three countries (Denmark, Ireland and Luxembourg) still have excessive government deficits, although the budgetary situation is rapidly improving;
- virtually all countries still have to adjust provisions in national legislation in order to conform to the statute of the European Central Bank. Many Member States are preparing or have presented proposals for changes in their legislation.

3.4 Current Status of Member States

3.4.1 Germany

The average inflation rate in the year ending in September 1996 stood at 1.3% that is the third best performance in the EU and is therefore below the reference value; during the same time period nominal long-term interest rates were, on average, 6.3% that is also below the reference value. The Council decided on 27 June 1996 that an excessive government deficit exists in Germany. In 1996 the general government deficit is expected to increase to 4.0% of GDP from 3.5% in 1995; the government gross debt ratio which has been below 60% is likely to increase in 1996 reaching 60.8% of GDP. Germany has been member of the ERM since its inception; in the latest two years the DM has respected the fluctuation margins of the ER and has not been subject to severe tensions and the DM bilateral central rate has not been devalued.

A number of measures, including freezing unemployment benefit, cut in assistance with medical charges and reducing some pension's entitlement, were agreed on 13 September (Wysocki, 1984). There are also long-term changes such as raising the retirement age from women from 60 to 65. The intention is to reduce the deficit to 3.5% in 1997, well below the Maastricht target (European Commission, 1994)

3.4.2 France

The average inflation rate in the year ending in September 1996 stood at 2.1% which is below the reference value; during the same period nominal long-term interest rates were, on average 6.6% which is also below the reference value. The Council has not yet abrogated its Decision of 26 September 1994 according to which an excessive government deficit exists in France. In 1996 the general government deficit is expected to be reduced by 0.8% percentage points to 4.0% of GDP; the government gross debt ratio continues to be below 60% of GDP in 1996. France has been a member of ERM since its reception; in the last two years the FF has respected the fluctuation margins of ERM and has not been subject to severe tensions and the FF bilateral central rate has not been devalued (European Commission, 1994).

3.4.3 Italy

The problems facing the Italian government in meeting the single currency criteria were for a long time thought to be so severe that there was no prospect of Italy being in the first group of countries joining the final stage of EMU in January 1999. However, the position changed following a meeting with Spanish Prime Minister Jose Maria Aznar at the end of September. Aznar made it clear that Spain was determined to be in the first wave and so there would be no joint Spanish-Italian grouping to delay the process.

Italian prime minister Romano Prodi said in an interview published in the Financial Times on 2 October: “when I saw that other countries were making serious efforts to address their budget deficits ... I realized Italy too could not miss the appointment with Europe.

The results are that the Italian government is now telescoping into the next year the changes it planned initially to introduce over 1997 and 1998. It intends to cut

spending by 10.5 billion in 1997, with around a quarter coming from reduced welfare spending. Taxes will go up by the same amount (10.5 billion), including 5.5 billion raised through special “Europe tax”.

However, in contrast to both Germany and France the budget in Italy has the support of the unions, who have reached a tripartite pact with the government and employers. The plan provides for the spending of 60 million on job creation over three year’s well measures to reduce working time (European Commission, 1995).

3.4.4 Spain

The Spanish budget published on 30 September is the tightest since the introduction of the new democratic constitution in 1978. The intention is to cut Spain’s public deficit to the target of 3% of GAP by 1997 compared with a 5.8% deficit in 1995 and what is likely to be around 4.7% in the current year.

This is done through cutting public investment by 6.5%, freezing wages and salaries and cutting the numbers of those working in the public sector and reducing other current cost by 6.3%. The government also expects its income to rise by 6.1% compared with expected inflation of 2.6% because of economic growth (European Commission, 1996).

3.4.5 Benelux

Of the three Benelux countries, Belgium, Netherlands and Luxembourg, only Belgium is likely to have difficulties in meeting the single currency criteria.

Luxembourg already fulfills all the requirements, with a public sector surplus, and the Netherlands is in easy striking distance of the Maastricht targets. Its public deficit is expected to be 2.6% of GDP this year and 2.2% by 1997.

Belgium, however, has much greater difficulties with its accumulated deficit. It is currently 131% of GDP, more than twice the Maastricht target, and the budget for 1997 aims to cut this by 4 percentage points as well as reducing the public sector deficit from the 3.2% of GDP expected for 1996 to 2.9% in 1997.

3.4.6 Scandinavia

All three of the Scandinavian countries that are members of the European Union, Denmark, Finland and Sweden are expected to have public sector deficits at or below the 3% single currency target in 1997. However, it will not be the Maastricht criteria but political considerations, which may keep Sweden and Denmark out of the first wave of single currency states in 1999. Denmark like the UK has an opt-out from the final stage of the EMU and in Sweden, where EU membership is now unpopular, the government has indicated that it does not want to be among the first group of countries to join (Green Paper, 1995).

3.4.7 Greece and Portugal

The only one EC state where it seems that there is no chance of having a single currency by 1999. Its inflation rate is running at three times the EU average and its public sector deficit could be as high as 6% of GDP in 1997 rather than the 3% Maastricht target.

Portugal has higher hopes of joining based on its past success in reducing the public sector deficit from 5.2% of GDP in 1995 to an expected 4.0% of GDP this year (Green Paper, 1995).

3.4.8 Austria

With its economy closely tied to Germany, Austria is also expected to be one of the first groups of countries to join the single currency. However, getting to Maastricht spending targets has only been achieved through a package of cuts in

expenditure, which have involved reductions in entitlements to pensions, unemployment benefits and other social program's.

In Austria the average inflation rate in the year ending September 1996 stood at 1.7% which is below the reference value. during the same period nominal long-term interest rates were, on average, 6.5% which is also below the reference value.

3.4.9 Ireland

The average inflation rate in the year ending in September 1996 stood at 2.1% which is below the reference value; during the same period nominal long-term interest rates were, on average 7.5% which is also below the reference value. The general government deficit has been below 3% of GDP since 1989 and is expected to be reduced further to 0.4% of GDP in 1996; the government gross debt ratio is likely to decline further to 74.7% in 1996 from 81.6% of GDP in 1995 (Jyoti Banerjee, 1996).

3.4.10 United Kingdom

In the United Kingdom the average inflation rate in the year ending in September 1996 stood at 3.0% which is above the reference value; In 1996 the general government deficit is expected to be reduced by 1.2 percentage points to 4.6% of GDP; the government gross debt ratio continues to be below 60% of GDP in 1996 (Jyoti Banerjee, 1996)

However the main obstacles to the UK joining a single currency is political rather financial. Both the Conservative government and the Labor opposition have indicated that they will not take a decision until after the election.

3.5 The agenda ahead for adopting the Single Currency

The start of Stage Three of Economic and Monetary Union on 1 January 1999 does not require a majority of the Member States to fulfill the necessary

conditions. Rather, in the early 1998, the Council, meeting in the composition of the Head of State or Government shall confirm which Member States fulfill the necessary conditions for the adoption of the single currency. The assessment will be made on the basis of actual data that for public finances will cover the outcome in 1997.

At the same time, the essential requirement of achieving a high degree of sustainable convergence has to be fulfilled. Indeed agents are beginning to look beyond the year 1999, and are starting to form expectations about likely long-term developments in the single currency area.

3.6 EMU Debate - Arguments in favor of EMU

The debate on European Monetary Union has not been ended. Doubts remain in spite of the ratification of the Maastricht Treaty, which ought to have put an end to them (Margaret Lamb, 1996).

The doubts not only relate to the technical methods of moving to Single Currency or its future name. The fact that two of the 15 Member States have secured the right to not be part of Monetary Union, that several Member States will not be in a position to take part right from the outset all these give rise to a certain skepticism to the firmness of the solemn commitments reaffirmed by the heads of state to complete this Union by the date and using the means laid down in the Treaty.

Finally, will not be complete if we do not examine the reasons, which are cited by those who oppose and defend EMU regardless of whether or not they are well meant.

Risk of race to EMU deadline. Work is now being undertaken which such intensity on many fronts that there is a risk that unwise decision will be taken and some issues to overlooked or not properly resolved (Simon Kennedy, 1996).

The Germans want the union to stop them from falling into Nazi ways. The French want to be cured of an inferiority complex. The Italians want to become nation. The Spaniards want to bury Franco. The Portuguese want to be French; the Greeks do not want to be Turks... (European Commission, 1993)

Linking irrevocably with Europe would further distance the UK from the engines of growth in the world economy tying it to a star whose light has already faded (Rod Barrett, 1996).

It will be much difficult to join later than sooner by remain outside, Britain loses competitiveness compared with those who are members of EMU, then it will be even harder for us to join the party at some later stage. Foreigners' companies would then much prefer to invest in countries that are members of EMU rather than one, which is outside. Thousands of British jobs would be lost as a result (Christopher Haskins, 1996).

EMU: an informed leap in the dark (Independent Article, 1996).

Why have things gone so wrong? Are likely to improve? The answer is that Europeans suffered from bad luck and made serious mistakes, but the economy is not doomed to fail. It could enjoy pleasant surprise in the year's ahead (Martin Wolf, 1996).

Yves-Thibault de Silguy, the commissioner in charge of monetary union said that progress towards meeting all these criteria was encouraging. "The forecasts for inflation, interest rates and the public finances of member states, confirm the Commission's view that there should be a significant and probably increasing number of member-states capable of meeting the necessary conditions.

Neutral on EMU: -

“The problem is that no one really knows how big these benefits may (or may not) be or what may have to be given up in process. The views of Sir John Egan, chief executive of BAA, are typical. He finds it too difficult at present to make a worthwhile judgment if the impact of a single currency on his business. He wants clear answers to three questions. ‘First, will it save much money? Second, will it make economies run better? Germany is obviously going to insist on a hard currency regime; that’s all very well but does you actually get any benefit in terms of employment and growth? Third, what sort of political effect will there be? Until these questions are answered, he says, ‘making your mind about EMU is a bit like asking your lover, ‘shall we get married?’ when you’ve only just met (Trevor Merriden, 1996).

‘We hope that as many member states as possible will be with us, and that others will join as soon as possible’ (Waigel, 1996).

‘The worst policy of all would be the British government not making up its mind and then joining late - that would be pathetic’ (Kennet Clarke, 1996).

‘It is important that the member countries do not just reach the criteria through a breathless short-term effort’ (Hans Tiemeyer, 1996).

‘You can understand the political impetus, but people have to understand that if the economies go wrong it will produce political tensions rather than removing them’.

3.7 The effect of E.C.U on Payment systems

Payment systems transmit the value of economic activity within and between Banks to Customer’s accounts. National payment systems assume that all values with them are expressed in the national currency and in no other. Today the natural

frontier of the payment system industry is that of the national currencies, because payment instruments by nature are essentially national. The creation of the single currency, by eliminating these frontiers will:

- modify national approaches in the direction of establishing means of payment within the monetary union.
- lead to a progressive increase in cross-border flows, the volume of, which remain relatively low compared with domestic markets.
- Improve the Interoperability of European Payment Systems, which today are heterogeneous.

The conduct of a single monetary policy in ECU by the European system of Central Bank (ESCB) and the emergence of a critical mass of activities in ECU would require the establishment of a European system of real time gross settlement (RTGS) for wholesale payments. TARGET (Trans-European Automated Real time Gross settlement Express Transfer) will be the payment system, specifically designed by the EMI, for the implementation of the monetary policy of the ESCB in ECU. This system will link the existing national RTGS systems to the ESCB. It's may also be used by private market operators for processing large value payments. This new payment arrangement operated by the ESCB should enhance technical efficiency, minimize systemic risk and the cost effective. As mentioned in the 1994 Annual Report of the EMI the operational features of the system will be defined in the course of 1995 by the EMI in close operation with EU central banks and other parties such as credit institutions.

Gross border payments are not only characterized by the exchange of currencies, but also by the fact that there is a switch from one-payment systems to another. However, the technical specifications of national payment systems are different notably for historical reasons. This explains why 60 or so EU domestic payment systems existing in the European Union, if they interconnect within their home country, are not inter-operate between the member states. In short, the domestic

automated clearinghouses (ACHS) of the Member States do not communicate with each other. As a consequence, credit transfers, for example between Member States has to be processed through the rather time and cost-consuming channel of correspondent banking. The commission recently proposed a draft Directive to improve cross-border payments. It is also important to accelerate work on the harmonization of standards, procedures as well as legislation on statutory declarations.

3.8 The impact of EMU on Financial Markets

The impact of EMU on financial markets will be different according to markets concerned: foreign exchange, debt, equity and derivatives' markets. In the financial markets of the participating currencies, economic convergence and the elimination of the exchange rate risk premium currency with lowest rate.

For investors, private and public issues, the move to EMU will result in a reduction of operating costs. By concentrating on one single currency instead of many, they will no longer bear foreign exchange or hedging costs. The impact for intermediaries will be in the form of a reduction of their operating cost, an increase in competition, and a loss of fees and commissions from foreign exchange transactions.

The main impact on investors will be the reduction of cross border transaction costs and the elimination of hedging costs vis-à-vis foreign exchange rate risk when investing in non-domestic shares.

The introduction of the ECU would encourage companies whose existing financial operations are domestically to become increasingly active in the Member States. This reasoning would be applied not only to large companies but also to a number of small and medium-sized companies.

EMU will become one of the world's two or three leading currencies, a symbol of the unity and power of Europe (Pascal Fontaine, 1994).

EMU will take effect in 1999 at the latest. Europe drew a detailed road map to reaching this objective (European Community Luxembourg, 1992).

3.9 Accounting Problems and Software

The introduction of the Euro will have major accounting implications for all companies. Even companies that have so far not made transactions in any foreign currency will be faced by the need to address the problem of currency translation in their account (Paul Taylor, 1996).

The EU Accounting Directives provide little guidance on financial reporting and contain no guidance on management accounting. Fourth EEC Directive on the annual accounting certain types of company contains a requirement that companies must set out in the notes to the accounts which policy has been applied translate foreign currencies, if applicable. Directive 90/604/EEC of 8 November 1990 amended the Fourth Directive to include an Article 50a requiring member states to allow companies in local currency at the exchange rate against the ECU at balance sheet date. The exchange rate must be disclosed in the notes. However, it left to member states the right to require companies to draw up accounts in the national currency. In 1995 a document was published by the European Commission containing a working document of the Accounting Advisory Forum, a consultative body to the Commission consisting of representatives from organizations of prepares, users and auditors of accounts and accounting academics.

The change to the Euro for management information purposes can hardly be done before the electronic data processing systems have been adapted to the new currency because it has an effect on the reporting systems in all layers of the organization and requires all detailed information to be available in Eurasia.

When changing over to the Euro the risk arises, both in financial and management accounting, of losing comparable historical data. This will be the case if historical data in foreign EMU currencies is converted directly to Euro amounts at the fixed exchange rate instead of first being converted into national currency amounts at historical rates.

From an accounting point of view there are numerous advantages attached to the introduction of the Euro. First, cost savings occur on currency translation for companies with operations in different EMU countries. Second, there will be less confusion between parents and subsidiaries because of currency exchange rate differences. Third, the common currency will make financial reports and management reports more transparent for the foreign reader, as they will not be distracted from essentials simply because of a lack of feeling for the value of another national currency (Euromethod, 1994).

On the other hand, the introduction of the Euro will cause large initial costs in terms of adaptation of software, documents and reports. These, however, are temporary so the long run can be considered positive.

Today, only the smallest company can contemplate running its business without the aid of the information technology (IT) in almost every corner of the operation: production and quality assurance, personnel systems and of course bookkeeping. Since businesses are expected to be among the chief beneficiaries of the single currency, it is important they understand the scale of the challenge and adopt a systematic approach. Moreover, it must be recognized that investment will have to start before all the facts about the single currency's introduction are known, including which countries will be participating.

The transition to the single currency should not however be viewed solely as an accounting and IT issue. It should provide the opportunity for the company to

fundamentally re-examine its business strategy taking into account the opportunities and threats of monetary union.

Any systems manages anything with a monetary value must be re-examine, such as accounts payable, accounts receivable, cash management, fixed asset register, general ledger, labeling, packaging, payments, payroll, pensions, production, risk management, sales and marketing, share registry and stock control.

A company's suppliers and customers will have their own systems and these also have the potential to cause problems and raise costs if they are not properly positioned for the Euro. For example if a customer's purchasing introduces rounding errors into its calculations, they may remit an incorrect amount in settlement of an invoice, causing expensive reconciliation and even credit management problems. Considering the number of suppliers and customers a company has to deal with, it is certain that problems like this will be a common feature at the outset of the single currency, and a well-run business will plan exception processing accordingly.

The phased introduction of the Euro produces a period of three to four years when the national currency will be used alongside the single currency. It is true that the Euro will be most visible in the financial markets, but even here there is no true dividing line.

It is important to remember that the principle of 'no-prohibition, no compulsion' will be operating during the period 1999-2002, so there is unlikely to be a common timetable for making the switch for all categories of customer or supplier. This may require the company to be able to handle both denominations for up to four years.

3.10 The role of accounting package

Can a company avoid most of the problems of operating during the transition period by relying on software suppliers to release EMU-proof versions of their packages, depending on which option it chooses for coping with Euro? The vendors themselves are generally confident. Indeed, multi-currency modules or version of many of the most popular packages already exists (Peter Wise, 1996).

Additional running cost needs to be allowed, at least during the transition, and an estimate made of the hardware and software platform that will be needed to deliver the required performance. In some companies, there may be the intention to move from a centralized system to more distributed client-server approach: such plans must be reviewed for compatibility with the accounting approach needed for the Euro.

Of course, a relatively smooth upgrade path assumes two things: the supplier of the software is still in business, and the package itself is still being supported and upgraded. If this is not the case, then the customer could be in a worse situation than with an in-house developed bespoke system, since the underlying code may be commercially or technically inaccessible. There may be no alternative to replacement.

It is not so early for a business to open dialogue with its application software vendors, since the availability of an Euro enabled version of its accounting software (Software World, 1989).

Once a business has defined the requirements at each stage of the transition to the single currency in terms of what systems are affected, this is the time for a dialogue with software vendors, since the changeover generates multiple buy-or-build decisions. Some systems will be too old, fragile or non-standard to warrant

the re-investment of switching to the Euro, so alternatives must be quickly examined and scheduled.

3.11 Software Testing

The proportion of development time that is needed for testing is always surpassingly high to non-technical managers. This will be especially true of EMU, since there is no comparable event to act as a comparison. Even with the most rigorous testing, it is also unavoidable that bugs and other problems will emerge in new and altered systems, so companies should expect their software maintenance activity to be proportionately higher in the years following EMU. One would hope that proper testing would have identified the most glaring errors, like conversion rates being the wrong way around. Organizations should also ensure that they have sufficient capacity to carry out the testing, either in-house or otherwise, remembering that a large number of businesses will be reaching the stage time at the same time.

It is truism in the software industry that although individual components and sub-programs may work fine in isolation, there can still be unexpected problems when they assembled together into systems. That is why careful co-ordination is necessary between the technical teams responsible for detailed changes.

Market requirements shift, new technology and software tools increase the options for achieving business goals, governments and central banks change their minds, and the best project management will be able to incorporate such factors into the plan as it evolves and moves to implementation.

The promise of the single currency is that eventual benefits outweigh the costs of conversion. Since at least 40% of those costs will be incurred in changes to IT systems, this will be the crucial battleground for the whole exercise, and the winners will be the companies who plan and execute a coherent transition to the

Euro. Failure will leave a company weakened and distracted for years - which is a dangerous condition in an ever more competitive environment in Europe and beyond.

3.12 Conclusion

Companies ignoring Single Currency will be weekend and distracted for years. Planning and actions urgently needed even before all information about single currency will be known. There will be a transition period of three years but still is not enough time to be ready by 1 July 2002.

Almost all countries comply with the join criteria and the agenda ahead for adopting the Single Currency continues despite the EMU debate.

EMU it is clear that will have an impact on the financial market, the payment systems and more in accounting.

No debate that there will be no longer foreign exchange or hedging costs. Single Currency will foster companies to become increasingly active in the Member States.

Introduction of Euro will cause large initial costs in terms of adaptation of software. All systems manages anything with monetary value must be re-examine.

There is no way out of Single Currency is a challenge with several promises, benefits but with traps and many unknowns.

4. Harmonization

4.1 Introduction

European Union tries to harmonise accounting practices in Europe by setting Directives and standards. Several bodies (European/International) aim to study the different practices and try to contribute to their removal.

This Chapter addresses the variation in European Accounting and show the basic principles and practices by which accounting regulated in Europe.

4.2 Directives

Should differences in Accounting be eliminated?

The elimination of the differences will clearly be difficult, costly and time-consuming task (Hilda Theunisse, 1994).

The principal beneficiaries would be those who use financial statements for decision-making and who make decisions on an International basis. Investors and creditors will be better able to understand financial statements of companies in foreign countries if they are similar to those of domestic companies. The same applies to employees, government and taxation authorities.

Multinational companies and firms of accountants will benefit in having fewer sets of accounting rules and practices to operate. Thus, staff time will be saved and staff become more transferable and technologies will be simplified.

The principal theoretical obstacle to elimination of differences is that they exist because of the different environments in which they developed. However, progress has been made towards eliminating differences in two ways:

- **Harmonization** is the process of making financial statements equivalent of comparable between countries either adopting the same practice or by disclosing differences between different practices.
- **Standardization** is the process of producing international accounting standards, which will be used by countries to develop or adjust their own standard practices.

In 1957 the Treaty of Rome established the objects of the Community as to establish the free movement of persons, goods and services, and capital. The Common Industrial Policy (1970) calls for the creation of a unified business environment including the harmonization of company law and taxation and the creation of a common capital market.

The instrument used in harmonizing EC Company law and accounting is the Directive. A Directive is not primary legislation but once agreed is binding on all member states that must incorporate in it into national law within a specific period. Member states are given several years to implement Directives. If they fail to meet the deadline the Commission will remind them of their responsibility.

DIRECTIVES ON COMPANY LAW	DRAFT DATES		DATE ADOPTED	TOPIC
First	1964		1968	Ultra vires rules
Second	1970	1972	1976	Separation of public companies, minimum capital distributions
Third	1970 1975	1973	1978	Mergers
Fourth	1971	1974	1978	Formats and rules of accounting
Fifth	1972	1983		Structure, management's and audit of companies
Sixth	1978		1982	De-mergers
Seventh	1976	1978	1983	Consolidated accounting
Eighth	1978		1984	Qualifications and work of auditors
Ninth				Links between public company groups
Tenth	1985			International mergers of public companies
Eleventh	1986			Disclosure about branches
Twelfth	1988			Single member company
Thirteenth	1989			Takeovers
Vredeling	1980	1983		Employee information and consultation

Table 4-1: Directives relevant to corporate accounting

At the global level, the increasing internationalization of business, the worldwide integration of the financial markets and the rapid internationalization of the audit industry have together put a very different set of pressures on both corporate reporting practices and to the modes for their regulations.

As a result of such developments, a series of new institutions for financial policy-making and regulation has been created at both the regional and international levels. We now have the International Accounting Standards, the UN Intergovernmental Working Group of Experts on International standards of Financial and Reporting, and the EU's Accounting Advisory Forum. With somewhat wider briefs are organizations like the International Federation of Accountants (IFAC), the International Organization of Securities Commissions (IOSCO), the Federation des Experts Comptables Europees (FEE) and numerous

other regional and international regulatory, occupational and pressure groups (Anthony G., 1994).

4.2.1 International Accounting Standards

In 1973 an International Accounting Standards Committee (ISAC) was formed by the professional bodies of nine countries. This body has grown, and by 1996 it had representatives from over 80 countries. The aim of the IASC is to formulate and publish in the public interest accounting standards to be observed in the presentation of financial statements and to promote their worldwide acceptance and observance.

The member bodies of IASC agree to support the standards and to use their best endeavors to ensure that published financial statements comply with the standards.

However, at the present time IASC standards are not enforceable. Therefore, the IASC is a source of possible reduction of accounting differences but within a European perspective plays a significantly lesser role than the EU. IASC is perhaps the most important and most successful (apart from the EC Commission which operates in a more restricted area). A list of IASC standards is shown in Table 2.4. In order to publish a standard must be approved by three-quarters majority of the board (Christopher Nobes, 1995)

IAS 1	Disclosure of accounting policies
IAS 2	Valuation and presentation of inventories in the context of the historical cost system
IAS 3	Consolidated financial statements
IAS 4	Depreciation accounting
IAS 5	Information to be disclosed in financial statements
IAS 6	Accounting responses to changing prices
IAS 7	Statement of changes in financial position
IAS 8	Unusual and prior period items and changes in accounting policies
IAS 9	Accounting for research and development activities
IAS 10	Contingencies and events occurring after the balance sheet data
IAS 11	Accounting for construction contracts
IAS 12	Accounting for taxes on income
IAS 13	Presentation of current assets and current liabilities
IAS 14	Reporting financial information by segment
IAS 15	Information reflecting the effect of changing prices
IAS 16	Accounting for property, plant and equipment
IAS 17	Accounting for leases
IAS 18	Revenue recognition
IAS 19	Accounting for retirement benefits in the financial statements of employees
IAS 20	Accounting for government grants and disclosure of government assistance
IAS 21	Accounting for the effects of changes in foreign exchange rates
IAS 22	Accounting for business combinations
IAS 23	Capitalization of borrowing costs
IAS 24	Related party disclosures
IAS 25	Accounting for investments
IAS 26	Accounting and reporting by retirement benefit plans
IAS 27	Consolidated financial statements and accounting for investments
IAS 28	Accounting for investments in associates
IAS 29	Financial reporting in hyperinflationary economies

Table 4-2: List of IASC standards

It is not surprising that the working language of the IASC is English and nearly all the Chairmen and Secretaries General have been from countries using Anglo-American or Dutch accounting, and that most standards closely follow or compromise between UK standards and US. Nevertheless, there is some IASC influence in continental European countries. The most obvious example is in Italy, where listed companies are required to follow IASC standards. It is apparent that conflict between IASC and EU standards is more than a rarity.

4.2.2 Other International bodies

4.2.2.1 International Federation of Accountants (IFAC)

This body came into exist in 1997 after the Eleventh International Congress of Accountants. It aims to develop a coordinated international accountancy profession. The IFAC has a full-time secretariat in New York and comprises an assembly of the same accountancy bodies as belong to the IASC. Its work includes the setting of international guidelines for auditing, education and management accounting; involvement in education and technical research; and organizing the international congress about every five years (David Alexander, 1992).

4.2.2.2 Fédération des Experts Comptables Européés (FEE)

The FEE stated work at the beginning of 1987, taking over from two earlier European bodies: the Groupe d'Etudes (formed in 1966) and the Union Européenne des Experts Comptables(UEC, formed in 1951).

FEE is based in Brussels and has member accountancy bodies throughout Europe. Its interests include auditing, accounting and taxation. It studies international differences and tries to contribute to their removal. Much of its work is connected with EC, and it advises the EC Commission on company law and accounting harmonization (David Alexander, 1992).

4.2.2.3 Other regional bodies

The two most important are the Inter-American Accounting Association (IAAA), which covers the two American continents, and the Confederation of Asian and Pacific Accountants (CAPA).

4.3 Variations In European Accounting

Today, although European accounting is certainly characterized by significant national diversities, the term has acquired a meaning. The objective of this section is to show the basic principles and practices by which accounting regulated in Europe.

FRANCE	GERMANY	UNITED KINGDOM	ITALY
<p>BACKGROUND</p> <p>The main feature of French Accounting is its legalistic nature, and it's well developed system of accounting regulation (Fortin, 1991).</p>	<p>Strong accounting tradition. Very different with Anglo-American tradition. Dominated by legal prescription. Strong and highly trained academic and practitioner accounting community (Dyckxhoorn, 1981).</p>	<p>The United Kingdom (UK) has a number of distinguishing features in its accounting environment that make the country distinctive within the European Community (Gee, 1992):</p> <ol style="list-style-type: none"> 1. A strong and independent accounting profession 2. A tradition of broad legal requirements with detailed accounting methods formulated by private sector regulations. 3. Strong links with US accountants, sharing a common language and with close connections between US and UK offices of the international accounting firms. 	<p>Italy has been remarkably dilatory in the implementation of the European Community Directive (Nobes, 1992). In 1991 it became the last member state to implement the Fourth Directive. In the same year the Seventh Directive was also implemented, ahead of Ireland and Portugal.</p>
<p>ACCOUNTING RULES</p> <p>The most significant regulation related to Accounting is the 1982 General Accounting Plan, which has been compulsory for all companies since 1983. The General Accounting</p>	<p>With the adoption of the Fourth Directive the general rules for financial statements can be summarized as follows:</p> <ul style="list-style-type: none"> • the financial statements must be clear and understandable • they have to be complete • offsetting of assets against liabilities and 	<p>In compliance with EC directives, UK legislation has prescribed formats and certain rules of accounting measurement; these provisions are now contained in the Companies Acts of 1985 and, for group accounts 1989. However, the tone of UK legislation continues to be flexible, tending to adopt the full range of options</p>	<p>In implementing the EC Fourth Directive, a requirement for accounts to present a <i>quadro fedele</i>, the 'true and fair view' requirement, was proposed and discussed in the academic journals. The 'true and fair view' is inherently contradictory to the Italian legal tradition of clarity in regulation. If fact the more restricted</p>

<p>Plan has been updated and adapted to the EU Fourth Directive.</p> <p>The General Accounting Plan makes the following accounting principles compulsory:</p> <ol style="list-style-type: none"> 1. Accrued income: the application of revenue and expenses has to be carried out in terms of the real flow that they represent independently of the moment in which they are received or paid. 2. Consistency of uniformity: the accounting policies of valuation and presentation of annual accounts must be maintained as long as there is no change in the circumstances that brought about their choice. 3. Cost of acquisition: everything has to be valued, at most, at the price of acquisition if the goods have been acquired, or at the production cost if they have been produced in the same company. 4. No set-off of assets and liabilities. 5. Identify between the initial balance sheet of one financial year and the final balance sheet of the preceding year: both balance sheets have to coincide. If profits and losses should be identified which correspond to previous years, they cannot be carried out directly against reserves but they have to be carried out through the profit and 	<p>income against expenses is prohibited the amounts included in the opening balance sheet must agree with the closing balance sheet of the preceding year</p> <ul style="list-style-type: none"> • valuation has to be made on an item-by-item basis • accounting has to be done prudently • accounting has to be made on an accrual basis and with the consideration of the matching principle • the valuation principles have to be applied consistently over the years • valuation is based on historical cost <p>Companies are free to establish stricter requirements in their statutes.</p> <p>Legal requirements concerning financial statements:</p> <ul style="list-style-type: none"> • Except for small non-corporations, all other companies have to prepare a full set of financial statements • Except for small non-corporations and small corporations, statutory audits are required • Except for small non-corporations all other companies have to publish a full set or at least a part of their financial statements • Large companies have to publish their single entity and group financial statements in the Federal Gazette before filing them with the Commercial Register • Large non-corporations do not have to publish their income statement, provided they disclose limited information (sales, investment income, payroll expenses, 	<p>allowed by the EC, and relying on the accounting profession to develop detailed guidance.</p> <p>In 1969, the ICAEW launched an initiative for the formulation of Statements of Standard Accounting Practice (SSAPs). The other CCAB bodies joined in to support the Accounting Standards Committee (ASC), which became a subcommittee of CCAB in 1976. The ASC formulated a series of SSAPs on a range of topics.</p>	<p>requirement for accounts to be veritiero e corretto (truthful and correct) has now been introduced. On this basis the new convention is unlikely, in practice, to change the tendency of Italian accounting (Haggi M., 1990).</p>
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<p>loss account for the year.</p> <p>6. Independence of the financial years: the profits and losses of each year have to be determined independently of the previous or future ones.</p> <p>7. Prudence: profits must only be accounted for when they have been gained.</p> <p>8. In the attachments to the accounts only information which is relevant to the other annual accounts must be included.</p>	<p>number of employees, depreciation/evaluation methods) in an annex to the balance sheet.</p> <p>In addition to the above, the company's management has to forward a full auditor's report to the members of the supervisory board only. On a voluntary basis, this is usually also made available to selected other addressees (e.g. banks and other important creditors).</p>	
<p>PRESENTATION</p> <p>The annual accounts are made up of:</p> <ul style="list-style-type: none"> • balance sheet • profit and loss • notes to the accounts <p>The accounts can be presented in three ways:</p> <ol style="list-style-type: none"> 1. Presented in summarized form. This option is available to individual businessmen and small companies. 2. Formulation of company documents is also needed. These are composed of the table showing effects on profits and losses account and other distinguishing elements of the portfolio over the last five years. 3. Statement of self-financing capacity for the financial year and the chart of financial 	<p>Traditionally UK legislation has not prescribed any particular format for the presentation of accounts. In line with the EC directive, format was permitted in the Directive. In October 1992, the Accounting Standard Board (ASB) issued Financial Reporting Council 3 (FRS), 'Reporting Financial Performance', which required certain disclosures and classifications if the items in the profit and loss account, FRS 3 includes suggested formats which comply with the standard.</p>	<p>The legally required annual accounts comprise the balance sheet, the profit and loss accounts, and the notes to the accounts. Only large companies have to publish the formats in full, both small and medium-sized companies being allowed to present abridged accounts (Nobes C., 1991).</p> <p>As in more EC countries, the abridged and the full accounts have the same basic structure with more detail in the latter. Comparative figures are required for both the balance sheet and the profit and loss account. Any change in the accounting policy or analysis should be explained in the notes to the accounts with sufficient detail to enable comparison of the current with the preceding accounting period to be made.</p> <p>In Italy, the balance sheet formats are similar to those in Germany. The balance sheet is the horizontal format, as permitted in the Fourth Directive. The profit and loss</p>

<p>changes. Voluntary option.</p> <p>Small companies are able to formulate simplified accounts. The profit and loss can be drawn up vertically or horizontally.</p>			<p>account is the on a vertical basis. The notes are part of the accounts.</p>
<p>GROUP ACCOUNTS</p> <p>The 1986 Decree to implement the Seventh Directive specified rules for consolidation, but at the same time gave companies the freedom to use rules for consolidation in other financial markets. The 1986 rules specify that all companies over which the parent has exclusive control should be included as subsidiaries. Exclusive control may be determined by:</p> <ol style="list-style-type: none"> 1. direct or indirect majority voting power 2. direct or indirect voting power of forty percent of the votes, if no other partner or shareholder holds a higher percentage 3. controlling influence as a result of a management of other agreement (provided that the parent has a share of the capital). 	<p>Regulations and principles for consolidated financial statements are largest the same for corporations and non-corporations.</p> <p>The basic consolidation provisions are:</p> <ul style="list-style-type: none"> • Parent companies with a domestic head office are obliged to prepare and to publish consolidated financial statements, either: <ol style="list-style-type: none"> 1. if they exercise control over one or more companies in which they own a participation of usually more than twenty percent or 2. if in principle they are able to exercise control by having the majority of voting right. • The group financial statements have to include the parent and all domestic and foreign subsidiaries. Enterprises are excluded if the inclusion would be conflict with the requirement of a true and fair view. <ul style="list-style-type: none"> • Three forms of consolidation are permitted by the law <ol style="list-style-type: none"> 1. full consolidation for subsidiaries under control 2. proportional consolidation 3. equity accounting for associated 	<p>The UK has a well-established tradition of presenting consolidated accounts. Required in legislation since 1947. UK has the one least affected by the requirements of the EC Fourth Directive (Hope, Grey, 1982).</p> <p>A company is held to be a subsidiary (S) of a holding company (H) if one of the five offers following conditions applies:</p> <ol style="list-style-type: none"> 1. H holds a majority of the voting rights in S. 2. H is a member of S and has the right to appoint or dismiss directors with a majority of the voting rights 3. H is entitled to exercise a dominant influence in S. 4. H is a member of S and, by agreement, controls a majority of the voting rights. 5. H has a 'participating interest' (more than 20 percent) in S and has a dominating interest or management is on a unified basis. 	<p>In implementing the EC Fourth Directive, a requirement for accounts to present a <i>quadro fedele</i>, the 'true and fair view' requirement, was proposed and discussed in the academic journals. The 'true and fair view' is inherently contradictory to the Italian legal tradition of clarity in regulation. If fact the more restricted requirement for accounts to be <i>veritiero e corretto</i> (truthful and correct) has now been introduced. On this basis the new convention is unlikely, in practice, to change the tendency of Italian accounting (Hagigi M., 1990).</p>

	enterprises on which a significant influence is exerted (e.g. twenty to fifty percent of the voting rights).		
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4.4 Conclusion

British is pulled in two different directions by conflicting demands for harmonization of financial reporting, from the European Community in one direction and from the International Accounting Standards Committee in the other (Weetman, 1992).

The differences in accounting practises are eliminated. The main theme emerging from the comparison of European accounting practices is that accounting practises are very similar to all European countries and the differences that still exists are rapidly eliminated.

The Auditing and Accounting rules of European countries are rigorously disclose with the collaboration of E.U directives and standards as well as with the other bodies aim to develop a co-ordinated accounting profession.

5. PEFIS Development

5.1 Introduction

“The use of global software is the only way to survive in the future. Global software the only way forward” (Management Accounting, 1996).

Until quite recently there have been very few packages that can offer Pan-European facilities on the DOS and Unix multi-user systems. Over the last two years, however, there has been considerable development and UK packages tend to be the market leaders.

Pan European system is designed specifically to meet the needs of companies operating throughout Europe. These companies mainly deal with fiscal legislation in many countries and currencies need to unify their financial, logistical and commercial administration with one product.

5.2 PEFIS Features

In order for application to be regards as Pan European the following features must be present:

- Standardization
- Translation
- Multicurrency
- Locales and Internationalization
- Different Platforms
- Portability, Scaleability, Interoperability
- User Interface

5.2.1 Standardization

Applications claiming to be PEFIS needs to comply with major FIS standards.

The use of standards assists in the efficiency and effectiveness of IS solutions. In the past very little advice was available on how to deliver services effectively, and when such advice was available, it tended to be proprietary, either in the form of specific machine-oriented advice from major suppliers like IBM and DEC, or in the form of a particular constancy's view point how operations should run e.g. the Hoskyn's approach.

Proposed FIS Standards

- International de jure standards and stable draft international standards.

They have the status of an international standard. Standards that have an international- wide dimension. e.g. OSI (Open System Interconnectivity), TCP/IP which appears to be winning battle of ideas with the OSI based de jure(international) standards (David Alexander, 1992).

- European and National standards and stable draft European standards.

Standards that have a European-wide dimension. e.g. the agreements of the General Agreement of Tariffs and Trade (GATT), the specific European directives, such as the EU European Commission directives, Suppliers Directive and the European Standards decision (Paul Turner, 1996).

- De fact specifications that are widely accepted by the industry, thus preserving the desired competitive market situation.

e.g. SQL Standard Query Language which is a dominance in relational database. Perhaps the best example is the dominance of Novell Netware as a network operating system, and hence the extensive use of Netware IPX as a network protocol to link PC's and servers. SMMP (Simple Network Management Protocol), de facto standard because it is supported by most network equipment suppliers, particularly those based in France.

Benefits of using standards-based framework:

- Standards achieve value for money in the use of both internal and external resources.
- Standards enable open competition in the procurement of systems and services in projects while safeguarding the return on the earlier investments.
- Standards improve the quality of information systems and services.

Green Paper

In October 1990, the Commission published a Green Paper on European standardization to emphasize the urgency of the situation and to call on the governments and industries of the member states to redouble their efforts. The European Standardization System proposed by the Green Paper aims to ensure the coordination, transparency and legitimacy of European standardization by applying common rules to all standardization bodies. It will allow for diversity in the organization of the sectional standardization bodies at European level (Green Paper, 1995).

Industry was urged to give a much higher priority in its overall strategy to European standardization. Greater involvement should be developed in direct funding of national and European standardization bodies, and priorities for standardization work, and releasing experts for consulting.

The government of member states were called upon to give formal acknowledgment to the new European Standardization System and to agree terms of cooperation with public authorities under EC law. They should be active in promoting European standardization.

The Commission felt the standardization bodies should urgently speed up their production of European standards. The Commission has proposed to set up a European Standardization System by the end of 1991 to allow sectoral autonomy in making standards, but also to ensure coordination through a new EC structure with a European Standardization Council and Board.

5.2.2 Translation

Some companies using local translators to do this task for them came unstuck quite badly in the introduction of packages into the appropriate country.

One nameless, prepared a French version and when the French customer came across to see it he took one look at the menu and split his sides with laughter. It had translated the cashbook literally to 'le sommier', which was the French equivalent to the base of divan bed, instead of 'journal de banque'. If the software has not been designed with the screen text held in a separate file for translation purposes, it means editing every individual program and recompiling. Translation is not only what you see on the screen, it also the reports and, even more important, the error messages. These are usually so obscure that even we have problems understanding them (Dennis Keeling, 1990).

A lot of companies rely their translation to companies offering documentation translation, software localization, technical writing, multilingual and multimedia service. (e.g. Midori S.A Company, Tradoc Global Localization Services).

These companies have been around Europe for many years concentrating on the translation of on-line help and software localization to all European languages and cooperation with them may be worthy and beneficial.

The biggest translation problem, however, is with the manuals. The IBM PC launch into Europe was delayed because of the huge translation problem of the operational and technical manuals. IBM decided to launch the PCs simultaneously in all European countries, and even with their mighty resources they had to enlist the help of Collins, the publishers, with the translation.

Tetra realized the importance of a separate text file, and incorporated this feature in its *Chameleon* package. The text files can be refined or translated without affecting the main programs, which remain independent of any language and can be updated globally. *Systems Union* has established close French-speaking links over the years, and they have translated and marketed their own French version including manuals. Today they have sold over 100 packages to European users.

Clearly, wherever its location, the package must possess the same underlying structure, yet it must allow each individual user to choose the language visible on screen displays, on reports, and in “help” texts, regardless of the company language or the local language to avoid the problem associated with having numerous copies of the software for each different language, systems must be designed as one copy with access to numerous language subsets. The centralized requirement for consistency is maintained whilst local business can operate in the chosen language of each user.

Similarly it is important that documents we send to customers and suppliers are printed in the language of the recipient, with the appropriate language. Furthermore the formatting of these documents according to local requirements needs to be inherent in the package.

5.2.3 Multicurrency

An obvious feature for PEFIS is the handling of multiple currencies. Firstly, any package to be run on European basis must be true Multicurrency software; that is can automatically consolidate into any base currency - it is not a series of single currency files which are run in parallel and which have merely an exchange rate applied to them for month-end consolidation purposes.

The main advantage of true Multicurrency systems is not the time saved in converting the figures at the end of the month, but accurate and timely management information about the state of the company's finances from day to day. Having this information gives companies the power to take remedial actions. For example by buying currency forward to limit their exposure, or decide on a strategic pricing policy for different country (Candice Goowin, 1991).

5.2.4 Locales and Internationalization

The process of creating globalize software has two facets: "internationalization" which covers generic coding and design issues, and "localization" which involves translating and customizing a product for a specific market. The software should conform to the different legislative and F.I.S practices in each country.

A European System must support a large set of locales (languages, cultural conventions). Microsoft Windows 95 supports 75 locales and Windows NT 4.0 50. Microsoft distributed a booklet internally that contained guideline for writing code and accommodated the needs of international developers and users.

Although Microsoft creates multiple-language versions of dozens of software products each year, its methods for doing so have not always enlightened. As Microsoft was solidifying its internationalization methods, Windows was becoming an international *de jure*. Companies that sought information on creating

localized applications for Windows began to ask for copies of Microsoft's internal handbook, which documented several years of Microsoft's collective internalization experience. In response Microsoft revised the handbook and made it widely available via the Microsoft Developer Network CD-ROM.

The chosen system must be capable of reflecting the way the local operations work while providing the standards and commonality of reporting required by the center. The system must be up-to-date, appropriate for the business needs and make good use of information they hold. With more European competition, the use of information systems will increasingly make the difference between competitive success and failure. The "local system" must present information in the local language and currency, but if data is to be transferred between them, they must be compatible.

5.2.5 Different Platforms

Hardware and software decisions can be made independently of each other, but only if we can provide software that is consistent across operating platforms, and is flexible enough to work in any strategy, either in a centralized hardware environment, or in a network or standardized hardware, or in a non-standardized hardware environment.

Another alternative is to design the software product in such a way that the central core is surrounded by an envelope which works as an interface with the system of the host machine. As the core product, which contains the business functionality, is written in portable code, it is not necessary to rewrite the core software for each type of hardware. It is only the envelope that is tailored to the requirements of the hardware, so we can upgrade the envelope, to match changes in hardware as they arise. This approach means that we can use the software throughout an organization regardless of the hardware in use.

Of course this difficulty nowadays are very limited as customers are selecting server and distributed computing, open systems, networking. The availability of open platforms like Windows and Unix, and of graphical user interfaces enables a more efficient communication of products from different sources. So no need to have an envelope tailored to each hardware configurations (Paul Turner, 1996).

5.2.6 Portability, Scaleability, Interoperability

When users adopt the open approach to computer purchasing, there are generally three things they are looking for: *portability* (the ability to run the same application on machines from various vendors), *scaleability* (the ability to run the same application on machines ranging from small to large) and *Interoperability* (the ability to have the machines communicate easily and process cooperatively) (Pamela Gray, 1988).

The introduction of new software has to be resource efficient. It should not disrupt the running of existing applications. PEFIS must contains integration software which will, enable controlled data import and export, and also provide simplified extraction routines to enable integration with other applications.

More importantly the introduction of new software should not disrupt the running of existing business or take a long time to get up and running. Frequency it does both. Moreover the reasons for these disruptions are largely of a psychological-political nature which arise when software strategy fails to instill local users with sense of 'owning their own system'. Companies need to 'sell' the strategy and the software within their own organizations to not only accommodate local users' requirements, but to be seen to involve the local users in the decision making process. This process beneficial - it means that local requirements are taken into consideration in that local users participate in the strategy, and the system that is developed is their own.

5.2.7 User Interface

The goal of internalization is to present users with a consistent look, feel and functionality across different language editions of a product (consistency of terminology). Users expect localized software to support the same basic set of features as the native language edition of the product does, and they expect it to achieve the same level of quality. They also expect different language editions to interact smoothly with one another. A single document format that all editions can load and interpret correctly is therefore essential.

If documents are unreadable from one language edition to the next, or if they convert with numerous errors, your product will get a bad reputation. International users become frustrated when software companies overlook what is for them key functionality.

For a program to meet the needs of an international audience, it must have features that an international audience can use. In addition to support for international character sets and national conventions this usually requires that the user interface be translated into several languages. A well-designed international core product minimizes the need for customizing features from different editions.

A user interface should be internationally acceptable and easy to localize. First use simple, generic graphics, and second avoid crowding those graphics. Designing consistent, easy-to-follow user interface that should result in a core program suitable for international markets.

Application should be both accessible and global. Avoid overlay complex designs. They are very difficult to see and difficult to translate. Use color carefully. Display warnings.

5.3 Design and development methodologies

5.3.1 SSADM

SSADM is one of the most mature and widely used structured methods in the Europe. However, it requires a significant investment in training and learning. SSADM has advantages over the other structured methods currently available (Ashworth C., 1990).

One of the most advantages is that SSADM builds up several different views of the system, which are used to cross check one another. In SSADM, three different views of the system are developed in analysis. These views are closely related to one another and are cross-checked extensively for consistency and completeness. The equal weight given to these three techniques and the prescriptive procedures for checking them against one another is great strength of the SSADM approach. The three views are:

1. The underlying structure of the system's data (Logical Data Structure)
2. how data flows into and out of the system and is transformed within the system (Data Flow Diagrams)
3. how the system data are changed by events over time (Entity Life Histories)

Another advantage of SSADM over a number of methods is that it combines techniques into a well-established framework, and so, as well as providing the techniques for the analyst, it gives guidance on how and when to use them.

Structured Method

Structured methods have these characteristics:

- they structure a project into small, well-defined activities and specify the sequence and interaction of these activities
- they use diagrammatic and other modeling techniques to give a more precise (structured) definition that is understandable by both users and developers.

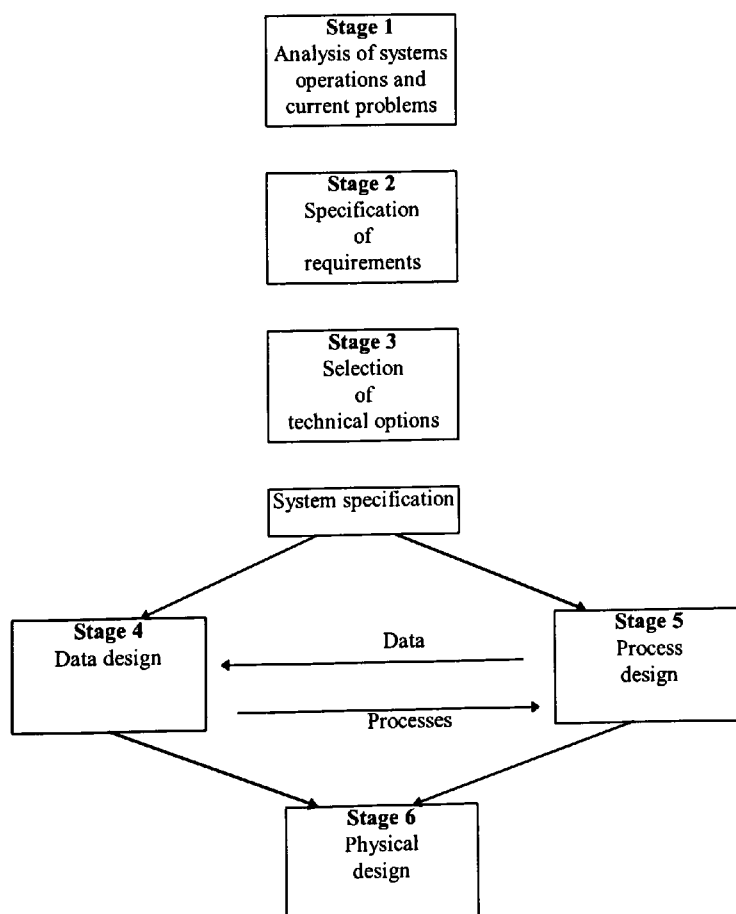
Structure techniques

The techniques of SSADM give standards for how each step and task is to be performed. The diagrammatic techniques of SSADM are:

- Data Flow Diagrams
- Logical Data Structures
- Entity Life Histories
- Logical Dialogue Design

In addition, there are techniques and procedures that are not diagrammatic including:

- relational data analysis
- first cut rules
- physical design control
- quality assurance
- project estimating



The figure in this page shows the stages of an SSADM project. Each stage is broken down into a number of steps, which define inputs, outputs, and tasks to be performed. The products of each step and the interfaces between steps are clearly defined.

The structure of the method illustrates

Figure 5-1: SSADM Structure

R.M. Liatsos 1998

several features of the SSADM approach:

1. The current system, in its current implementation, is studied first in order to gain an understanding of the environment of the new system.
2. This view of the current system is used to build the specification of the required system. However, the required system is not constrained by the way in which the current system is implemented.
3. The specification of requirements is detailed to the extent that detailed technical options can be formulated.
4. The detailed design is completed at the logical level implementation issues are addressed.
5. The logical design is converted into physical design by the application of simple rules. The resulting design is tuned using the technique of physical design control before implementation.

5.3.2 The Unicode Standard

The Unicode character-encoding standard is fixed-width, uniform text and character encoding scheme. It includes characters from the worlds, as well as technical symbols in common use. The Unicode standard is modeled on the ASCII character set. Since ASCII's 7-bit character size is inadequate to handle multilingual text, the Unicode Consortium adopted a 16-bit architecture, which extends the benefits of ASCII to multilingual text. Unicode characters are consistency 16-bit wide, regardless of language. Unicode character encoding treats symbols, alphabetic characters, and ideograph characters identically, so that they can be used simultaneously and with equal facility (European Trends No. 3, 1991).

The primary goal of the Unicode project was to remedy serious problems common to most multilingual computer programs: overloading of the font

mechanism when encoding characters, and use of multiple, inconsistent character codes caused by conflicting national character standards.

The ASCII character set and its extensions, Although widely used and accepted as standard in most computing systems, are limited to 256 characters. ASCII is therefore inadequate in an increasing complex global computing environment.

The groups most affected by the lack of a consistent international character standard are the publishers of scientific and mathematical software, newspapers and book publishers, bibliographic information services, and academic researchers.

Research and analysts of software systems revealed that Unicode meet the following standards:

- Completeness

The coded character set would be large enough to encompass all characters that were likely to be used in general text interchange.

- Efficiency

Plain text, composed of a sequence of fixed-width characters, provided extremely useful model because it was simple to parse: software would not have to maintain state, look for special escape sequences, or search forward or backward through text to identify character.

- Uniformity

For efficient sorting, searching, display, and editing of text, a fixed character code size would be preferable to the more complex run-length encoding schemes in current use. Although a wide character code is not always necessary, particularly in the case of scripts that contain a limited number of characters, the many benefits of a uniform character width outweigh the argument in favor of codespace economy.

The Unicode Consortium

The Unicode Consortium was formalized in January 1991 to promote the Unicode standard as an international encoding system for information interchange, to aid in its implementation, and to maintain quality control over future versions. The Unicode Consortium was incorporated as a non-profit organization under the name *Unicode, Inc.*, to provide a central focus and contact point for conducting these activities. Membership is open to organizations anywhere in the world that support the Unicode standard in principle and that would like to assist in the widespread implementation. The consortium is supported through the volunteer efforts of its members (and their companies), and financially through the membership dues.

The Consortium's board of directors and officers come from a variety of organizations and represent a wide spectrum of text encoding and computing applications. The Unicode Technical Committee conducts the Consortium's activities. The Unicode Technical Committee (UTC) is the working group within the Consortium responsible for the creation, maintenance, and quality of the Unicode standard.

5.3.3 The Euromethod Project

The single European market challenges many insular standards and conventions in technology and commerce. Information systems, in particular, face a tremendous challenge, so the European Commission has funded Euromethod an attempt to provide standards for the procurement and development of information systems across the boundaries of the European Union's member countries (Paul Turner, 1996).

The Euromethod project is a major initiative of the European Union, which through its IT standardization policy unit and the IT departments of various

member states, is seeking to produce a mechanism for procuring and developing IT systems across Europe. Euromethod is not just another method, but seeks to provide an umbrella or framework under which existing methods can continue to be used with immediate interchange benefits as well as providing a long term strategic focus for common PEFIS management and development. Euromethod will ultimately belong to its users because it will be placed in the public domain for all to use. The major goals of Euromethod are divided into subgoals:

- Improve the customer/supplier relationship in an Information Systems development and maintenance situation by the use of a common terminology.
- Improve the understanding of call for tenders proposals and contracts.
- Assist the harmonization of methods across Europe, particularly those related to I.S development.
- Improve the effectiveness and flexibility of IS development and maintenance approaches through adaptability to a wide range of problem situations.

The Euromethod project identify four approaches that are considered important from the customer-supplier relationship point of view:

1. *The system installation approach*

Which defines how the information system is going to be installed in the target domain.

2. *The system construction approach*

Which defines how the information system is going to be constructed and tested.

3. *The system description approach*

Which defines how the information system is going to be designed and described.

4. *The project control approach*

Which defines how the project is going to be controlled (Euromethod Concepts Manual 1, 1998).

Euromethod is an important project that is very useful to be applied by all the companies want or operate in Europe. Is a general framework that will help organizations to address:

- The complexity and the uncertainty of information system especially in Europe
- Stability of the environment
 - Political stability (e.g. changes of governments)
 - Legal stability (e.g. changes in law and regulations)
 - Market stability (e.g. changes in the offer and demand, changes in competition)
 - Business stability (e.g. changes in the nature of the business)
 - Financial stability (e.g. changes in the financial situation)
- Formality of Business processes:
 - Formality is the conformity to rules and elaborate procedures
- Quality of information system
 - Define the required quality assurance procedures that a deliverable has to pass in order to be considered of adequate quality

Euromethod project is supported by a range of huge European organisations and is evolving so rapidly that it is expected in the near future to be in a state to provide standards for the procurement and development of information systems across the boundaries of the European Union's member countries (Euromethod Concepts Manual 3, 1998).

In the results of the questionnaire it is apparent that organizations are using their own designed methodology to construct their software. Euromethod is not trying to change that but to help them redesign their methodologies by addressing issues and ways of achievement (Antonio Lamborchini, 1998).

Related to the proposed PEFIS criteria, Euromethod clearly support that a system to be sustain its existence in Europe must at least comply with the basic requirements:

- Efficiency

The relationship between the level of performance of the system and the amount of resources used

- Security

Ability of the system to prevent unauthorized access

- Reliability

The capability of the information system to maintain its level of performance under stated conditions for a stated period of time.

- Maintainability

Modifications may include corrections, improvements or adaptation to changes in environment, and in requirements and functional specifications.

- Portability

The ability of the computer system (or one of its components) to be transferred from one environment to another.

- Usability

Usability bears on the effort needed for the use of the computer system (or one of its components) by the users.

Euromethod supports a great number of our suggested criteria but doesn't suggest any ways to achieve those. Is so broad at the moment and addresses almost all the factors that influence the development of a PEFIS, but is not yet reach a stage of maturity, which would allow it to support complete PEFIS development.

5.4 Implementation languages

5.4.1 Visual C++

5.4.1.1 Introduction

Visual C++ is the leading European implementation language used to develop software across Europe. Its success derives from a number of powerful tools, which facilitate the development of European Systems. Is not by luck that it is by far the most used implementation language nowadays (Al ashim, 1988).

Microsoft Visual C++ is now an established mainstream product. Dozens of C++ and Visual C++ books are available, and the C++ language is being taught at major universities.

The last version of Visual C++ version 4.0 requires either the released version of Windows 95 or version 3.51 or later of Windows NT. Visual Basic is a 32-bit implementation language. Because 32-bit programs are so much bigger than 16-bit programs and because the Visual C++ development environment has become more complex, at least a 90-MHz Pentium-based computer is suggested.

Until recently, Windows based programs have used only the ANSI character set, which consists of 256 single-byte characters. Developers targeting the World software market are moving to the Unicode character set, which consists of 65,536 2-byte (wide) characters.

5.4.1.2 European Features of Visual C++ 4.0

- Windows 3.x, Windows95, Windows NT
- Visual C++ 4, incorporate all the features of Microsoft windows (e.g. Keyboard Layouts, Date, time formats etc.)

- Graphics Device Interface (GDI)

Instead of addressing the hardware, your program calls GDI functions. Windows provides the video board and printer drivers, so program does not need to know the type of video board and printer attached to the system.

- Resource Based Programming

Store data in a resource file using a number of established formats. The linker combines this binary resource file with the C++ compiler's output to generate an executable program. Resource files can include bitmaps, icons, menu definitions, dialog box layouts, and strings.

- Dynamic Link Libraries (DLLs)

Dynamic linking means that specially constructed libraries can be loaded and linked at runtime. Multiple applications can share dynamic link libraries, which saves memory and disk space. Dynamic linking increases program modularity because compile and test DLLs can be done separately.

- Open Database Connectivity (ODBC)

Supports ODBC. ODBC allows application to access and update data stored in many popular databases such as Microsoft Access, FoxPro, and SQL server. It greatly simplifies development, making it easier for developers to provide access to data in multiple databases. Modifications to networking services, servers and databases will not impact ODBC applications.

- Object Linking and Embedding

For developers of integrated solutions, OLE is a powerful way to build an integrated solution using multiple applications, and offers many more features to implement. Although OLE supports a number of advanced features, the most important feature for designers of integrated solutions is called *visual editing*. With visual editing, users can double-click an object, without switching to a different application or window. With OLE, programmers can define a set of

operations and make them accessible to other applications. These operations can even have argument lists much like function call in a programming language. The result of this capacity is that applications can interact with one another without human interaction.

5.4.2 Java

5.4.2.1 Introduction

Java is one of the most exciting developments in the history of the Internet. Java language and environment are rich enough to support entirely new kinds of applications, like dynamically extensive browser.

The Java programming language , developed at Sun Microsystems under the guidance of Net luminaries James Gosling and Bill Joy, is designed to be a machine-independent programming language that is both safe enough to traverse networks and powerful enough to replace executable code.

Right now, most of the enthusiasm for Java stems from its capabilities for building embedded applications for the World Wide Web.

5.4.2.2 European Features of Java

- **Simple**

The developers of Java based it on the C++ programming language, but removed many of the language features that are rarely used or often used poorly (Richard K., 1996) . Specifically, Java differs from C++ in these ways (Laura Lemay, 1996):

1. Java does not support the *struct*, union, and pointer data types.
2. Java does not support *typedef* or *#define*

3. Java differs in its handling of certain operators and does not permit operator overloading
4. Java does not support multiple inheritance
5. Java handles command line arguments differently than C or C++.
6. Java has an automatic system for allocating and freeing memory so it is unnecessary to use memory allocation and de-allocation functions as in C and C++.

- **Object-Oriented**

Like C++, Java can support an object-oriented approach to writing software. Ideally, object-oriented design can permit the creation of software components that can be reused.

- **Distributed**

Unlike the languages C++ and C, Java is specifically designed to work within a networked environment. Java has a large library of classes for communicating using Internet's TCP/IP protocol suite, including protocols such as HTTP and FTP.

- **Interpreted**

When the Java compiler translates a Java class source file to bytecodes, this bytecode class file can be run on any machine that runs a Java interpreter or Java-enabled browser. This allows the Java code to be written independently of the users' platforms. Interpretation also eliminates the compile and run cycle for the client because the bytecodes are not specific to a given machine but interpreted.

- **Secure**

Because Java works in networked environments, the issue of security is one that should be of a concern to developers. Java puts limits on pointers so that developers cannot forge access to memory where not permitted. These aspects of Java enable a more secure software environment.

- **Portable**

In C and C++, source code may run slightly differently on different hardware platforms because of how these platforms implement arithmetic operations. In Java this has been simplified. An integer type in Java, *int*, is a signed, two's complement 32 bit integer. A real number, *float*, is always a 32-bit floating-point number. These consistencies make it possible to have the assurance that any result on one computer with Java can be replicated on another.

- **Dynamic**

Unlike C++ code, which often requires complete recompilation if a parent class is changed, Java uses a method of interfaces to relieve this dependency. The result is that Java programs can allow for new methods and instance variables in objects in a library without affecting their dependent client objects.

- **Scalability**

At the lowest level, Java programs consist of classes. Classes are intended to be small, modular components. They can be separated physically on different systems, retrieved dynamically.

Within a package, a class is either publicly visible or protected from outside access. Packages form another type of scope that is closer to the application level. This lends itself to building reusable components that work together in a system. Packages also help in designing a scaleable application that can grow without becoming dependent.

5.5 PEFIS Developers

Many packages boast Multicurrency, Multilanguage features etc., but truly comprehensive PEFIS are more of a rarity. Developing a PEFIS seems to be quite

straightforward - just the transaction of the package into the appropriate foreign language. But unfortunately it is not as easy as that.

Some of the most pioneers PEFIS are (CMG, 1996):

<i>Company</i>	<i>Software</i>
Dillon Technology	Word Series
Shortlands	Cold
Systems Union	SunAccounts
Tetra	Chamelleon
JBA'S	Business 400, JBA System
CGI Information	Sagagip Finance
SAP	R2/RF-RK
Coda	Coda/Ias
Accounts II Software	Accounts II
Agresso	Agresso
Aquila computers	Manufactura
Baddow Hall Group	Opera, Capital
Boole & Babbage Europe	Komand
Cedardata	cfacs
Chorus Software	Chorus
Computer Associates	CA Masterpiece/Client Server
Computer Foundations	Foundation 2000
Computron Software Europe	Coins
Densitron Software	Relax + Trade
Dun & Bradstreet Software	Smartsream
JD Edwards	Oneworld-World Software
Exact Software	Globe for windows
Exchequer Software	Enterprice
FourFron	Copyright
Great Plains Software	Dynamics LAN & Dynamics C/S+

IBM (UK)	Concorde XAL
Kalamazoo Computer Solutions	CS/3
Kewill-Omicron	Dynamics
Lawson Software	Lawson Insight
Macro 4 Open Systems	PSS-BACS
MDIS-McDonnell	PRO-IV Financials
NSC Programming	Powerdrive
OpenAccounts	OpenAccounts
Oracle	Oracle Financials
Pegasus Software	CAPITAL, Pegasus Opera
Peoplesoft	Peoplesoft Financials
Propath Software	Propath Financials
ROCC Computers	ROCC Uniclass
Ross Systems	Renaissance
SAP (UK)	R/3
Software AG	Finest

Those Systems enable users to configure the software so that different languages can be used on the same system.

Chameleon Package

It has been available in English, Germany, Danish, Portuguese and Spanish and has recently added Crech and Polish language version. "A Hungarian version will be soon be available. Intergraph now has his system installed in around 18 European countries. Chameleon offers good Multicurrency facilities and flexible reporting facilities.

Business 400

Air Express International uses Business 400 in many countries, including Hong Kong, Canada, Netherlands Belgium and France. Chameleon provides a common interface from the logistics information software, configured in the same way and

eventually enable its customers to have local fiscal reporting , regional reporting , such as Europe, and consolidation at corporate level.

PowerSystems

The PowerSystem includes General Ledger, sales order Processing, sales ledger , purchase ledger, stock control, and payroll. PowerSystem is well know from the Multilanguage and Multicurrency features it has.

Systems Union - Sunsystems

Now, with 16 offices worldwide, Systems Union is one of the world's premier suppliers of client/server accounting solutions for business. With annual growth financed mainly by retained earnings and averaging 40%, the company is set to continue its expansion both geographically and through the further development of its product portfolio.

Customers in more than 160 countries can utilize up to 20 language variants of Sunsystems to manage their business. Systems Union has been writing and supplying Sunsystems software for more than ten years and has grown to become one of the leading suppliers of financial management software in the world. Based on a commitment to innovative excellence in development, Systems Union can deliver a competitive advantage to customers through the application of Sunsystems, technology and best management practice. Systems Union is the 15th largest business applications supplier in Europe according to Ovum, May 1995. Systems Union is 20th in the European Software Top 50 according to Computer Business Review, June 1995.

5.6 Conclusion

European Commission speed up the production of European standards. There are several types of standards with different dimensions (European-wide, International-wide etc.).

PEFIS needs to comply with the current standards and to be flexible enough to incorporate future standards effectively.

Many software developers advertise their system as Pan-European even though in most cases they don't even comply with the basic requirements like Multicurrency, Portability.

This Chapter discusses the importance of developing a PEFIS and the features must be present to any Pan European System.

Before introduce PEFIS features to its systems, company requires a significant investment and learning concerning design and development methodologies.

Choosing an implementation language is very important. Programming languages (e.g. Visual C++, Java) are very successful as they supported by a number of powerful tools, which facilitate the development of European systems.

6. Criteria to assess PEFIS

6.1 Introduction

This Chapter discusses the importance considerations that PEFIS developers must take into account before formulating a strategic plan and before starting development cycle.

Every organization success depends on how well it organize its product design team and the setting up of the development environment.

6.2 Product Design Team

The process of creating a PEFIS involves a much communication between different members in the product team.

The various sections involved in the product team are:-

- Localization Section
- Analysis/Design/Development Section
- Testing Section

Figure 6.1 outlines the basic lines of communication. During the core phases (*See Circle in figure 6.1, Development, Testing, Localization, Feature design, Translation tools*) , the development team provides files to localization team, which translates text, reissues dialog boxes, and hands files back for compilation. The localized executable then goes to the testing team, which reports functionality problems to development and user interface problems to localization. All three groups' work together to resolve bugs, and the cycle continues until the application is completely satisfactory (Nadine Kano, 1996).

The best way of developing PEFIS is one in which the product team considers European issues during critical feature design and coding design stages. Market forces, usability tests, and development constraints also affect the overall design of the product.

It is important to “freeze” as much of the user interface and feature design as possible well before the product goes into final changes of development. Late changes may cause significant and expensive delays in the release of a PEFIS.

The golden rule for developing PEFIS is to plan ahead. With a good plan, you can create software in a single effort that will accommodate multiple language (Nadine Kano, 1996).

6.3 The Organizing of the Product Team

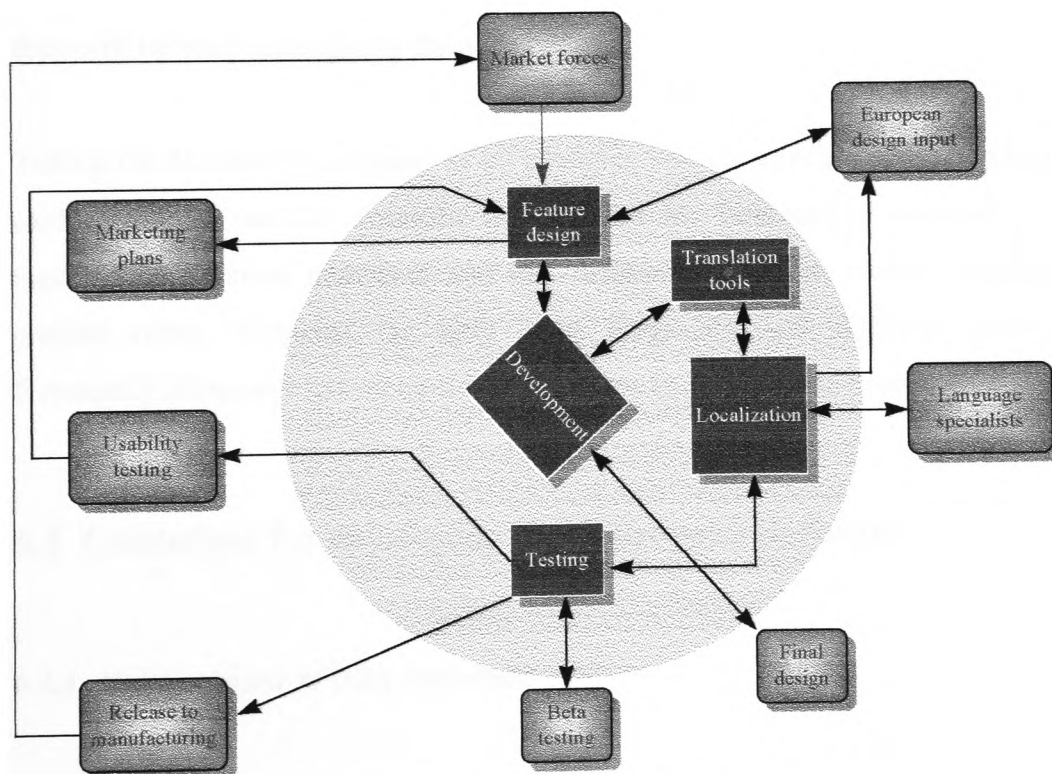


Figure 6-1 : Pan-European Financial Systems Process Prototype

The golden rule for a product team is:

- Educate all product members responsible on European issues
- Develop at least one localized edition in parallel with the domestic edition.
- Hold all the team members responsible for the European functionality of their features.

Arguing that holding the whole team members accountable for all European products will cause a loss of focus, but in reality such a policy will save time and effort. Developers who are responsible for only the domestic edition of product may have no incentive to design global code, and might not even be aware of this issue. Later, when problems are uncovered during the programming translation and testing phase, those developers, will have to spend time repairing errors that may have been avoidable; instead of working on the next version of the product, they will be busy redesigning the code.

Taking the Microsoft Company as an example, wholly separate teams worked on each product - one for domestic and another for International software- they reported to separate managers and had different objectives. This arrangement created many problems, as each team invariably had different priorities. Eventually Microsoft has merged the two teams to get over the problem.

6.4 Guidelines for developing Pan European Software

6.4.1 Development of User Interface

In general there are two basic rules applied to the design of an international acceptable user interface

1. The use of simple and generic graphics
2. Avoid complicated graphic screens

Figure 6.2 shows several bitmaps/icons that would be confusing the European users.

It is important to be cautious with:

1. Animals
2. Religious
3. Mythological symbol
4. National emblems
5. colors
6. people
7. counties

Avoid

1. Image of sports equipment
2. National monuments
3. Symbols that might be familiar in some cultures but unfamiliar in others.
4. Pictures represent a play of words in one language might be completely meaningless in others.
5. Be culturally sensitive when choosing sounds for program

The aim of User Interface is

- Present users with a consistent look, feel and functionality across different language editions of product.
- Create User Interface that would be recognizable in any language. e.g. Non French speakers familiar with English edition could still find their way around the French edition.

6.4.2 Text

The length of text often grows when it's translated. For example the English word "*Edit*" becomes "*Bearbeiten*" in German. So design menus bars, status bars, toolbars, title bars and dialog boxes to allow text size to increase.








Bitmap/Icon	Translation Issues
	<p>This picture representing American football would not be useful to Europe. Alternative symbols, such as those used at the Olympic Games would suggest "sports" to an international audience</p>
	<p>The plug pictured here is a type used in the Italy (two flat pins). Plus on the European continent have two or three aligned round pins , and British have three square pins arranged in a triangular position.</p>
	<p>In Europe, this road sign is blue, the lettering is white, and the text varies.</p>
	<p>This metaphor, "under the thumb" does not exist in all languages</p>
	<p>The translation of "wizard" in many European languages doesn't have anything to do with magic; therefore, the wizard's magic wand is not an obvious reference. It could be a bubbling test tube of a lit cigarette.</p>
	<p>Initial caps on button faces representing bold, italic, and underline will have to change for a number of languages.</p>
	<p>These bitmaps represent an alphabetical sort command , but in some languages, Z isn't even a letter. "A-Z" doesn't represent the full range of the alphabet for Scandinavian languages.</p>

Figure 6-2 : Bitmaps and icons that would be confusing in a European context

6.4.3 Keyboard Layout

Keyboard layout change according to locale. Not all characters exist in all keyboard layouts. When assigning shortcut key combinations, make sure that you can reproduce them using European keyboards.

Most European Keyboards contains an AltGr key. Do not assign characters that are produced using either AltGr or Shift+AltGr shortcut-key combination. The shortcut-key combination Ctrl+Alt+[for example can not be reproduced on Portuguese, Spanish, Swedish keyboards.

6.4.4 Research Legal Issues

Solicit advice from people familiar with the law in local Markets. e.g. Software that connects with telephones can be more difficult to sell in Europe, where some governments closely regulate the use of phone lines.

Keep in mind that entering new market requires diplomacy and the more effort you spend the higher the risk and cost but the greater the potential return.

In Germany for example, competition law severely restricts a company's ability to claim that its product is better than another company's product. This directly affects advertising and packaging, but it can also affect sample files, documentation, help files, on features that assist in making the transition from a competitor's product to our product.

6.4.5 Setting up the development environment

A key prerequisite to create a European core code base for your program is that all language editions share the same core source files. Maintaining separate source files for different editions of the same product is error-prone, a waste of time and disk space and unnecessary. Your code will be slightly different for some language editions. If you using the C programming language for instance, you can manage these differences by using `#ifdefs` carefully and sparingly.

Just as all language editions share a single set of source files, all language editions should share a single bug database or bug-tracking system.

Those responsible for testing certain features in native editions should also be responsible for testing the same features in the European editions. It's good idea to have dedicated test scripts for localized products and help from native speakers to test certain features, but the most successful philosophy is that of one product, one team.

6.4.6 Eliminating Compile Dependencies

A major incentive for creating European core code does not have to recompile source files to create localized editions of your program. If you eliminate compile dependencies by avoiding hard-coded strings or constants, and by not putting localized resources to main program files, your localization process will go much faster.

To create localized editions, you compile only the localized resource files and link them to the main program e.g. Microsoft link them to executable or to a separate DLL.

This “no compile” strategy has a number of obvious benefits. Separating code from localizable resources helps you write European code. Significantly reduced compiled times allow for faster turnaround in the development, testing, and translation cycle. Testers have to test only one executable. Translators, especially third-party consultants, do not need to have access to source code.

6.4.7 Smart Coding Practices

Many of programming practices currently taught in classrooms and in textbooks completely ignore the possibility that a program will be translated or will require multilingual functionality.

- Avoid hard-coding localizable elements

Hard coded strings, characters, constants, screen positions, filenames, and file paths are difficult to track down and localize. Isolate all localizable items into resources files and minimize compile dependencies.

In the following code segment, *szInputString* is a string from a list box selection, and the programmer is assuming that the selection can be for only one of several English words: *Open*, *Save*, *Find*, *Copy* and *Paste* (David J. Kruglinski, 1995).

```
switch (szInputString[0]);
{
    case 'O';
        DoOpen();
        break;
    case 'S';
        DoSave();
        break;
    case 'F';
        DoSearch();
        break;
    case 'C';
        DoCopy;
        break;
```

```

        case 'P';
            DoPaste();
            break;
    }

```

This code is efficient, but it's difficult to translate. Translating the character constants in this switch statement requires editing code directly.

One solution is to concatenate the single characters into a string that can then be placed in a resource file. Instead of comparing `szInputString[0]` with character constants, the revised code searches for it in the concatenated string and returns an index to the string if it finds a match. The switch statement is based on the possible index values.

```

... In the Resource file , Localized file
STRINGTABLE DISCARDABLE
BEGIN
    //OSFCP are the first letters of Open, Save, Find , Copy , Paste
    IDS_ABBREVS_COMMANDS "OSFCP"
END

... In the .C file , source file
#define CAOpen 0
#define CASave 1
#define CAFind 2
#define CACopy 3
#define CAPaste 4

char szCommands[cbMaxSz];
int iCommand;

LoadString(hinst,IDS_ABBREVS_COMMANDS, szCommands, cbMaxSz);
iCommand = GetIndex(szInoutString[0], szCommands);
switch (iCommand)
{
    case CAOpen;
        DoOpen();
        break;
    case CASave;
        DoSave();
        break;
    case CAFind;

```

```

        DoSearch();
        break;
    case CACopy;
        DoSave();
        break;
    case CAPaste;
        DoPaste();
        break;
}

```

- Make buffers large enough to hold translated text

Buffers that are declared to be the exact size of a word or a sentence will probably overflow when text is translated.

- Do not assume that characters are always 8 bit.

Code that assumes that character is 8 bit wide does not work for double-byte character sets.

- Do not localized strings saved as part of your file format
- Avoid certain coding shortcuts
- Clever use of strings

Try to save space through clever use of string such as concatenating string fragments to form a complete string rather than creating a number of similar complete string (David J. Kruglinski, 1995). For example look at the next example of code, which could be used to form these English messages:

```

        "Not enough memory to open the file Filename1."
        "Not enough memory to save the file Filename1."
        "Not enough memory to spell-check the file Filename1."

Char SzString1[] = "Not enough memory to"
Char SzString2[] = "the file";
Char szFinalString[cbMaxSz] =
    ConcatenatefiveStrings(szString1, szCommand , szString2 , szFilename , ".");

```

- Making life easier for translators

Clarify the context of strings that should be translated, preferably by providing comments in resource files or separate files.

- Testing considerations

Never postpone fixing bugs found in domestic software product that affect European program.

6.4.8 Unicode

Most developers of International-based programs have at some point banged their head against the wall trying to come in cope with character encoding.

A band of International thinkers has created a standard for the future called Unicode, which newer operating systems such as Microsoft Windows NT have adopted. But until Unicode is more widely used, programmers will still have to navigate through a rough sea of character encoding standards.

Unicode is a fixed-width, 16 bit world-wide character encoding that was developed and is maintained by the Unicode Consortium, a non-profit computer industry organization.

Unicode encompasses all characters used widely in computer today. This includes most of the worlds written publishing characters, mathematical and technical symbols, geometric shapes, and punctuation marks. The ultimate goal of using Unicode is to create a single worldwide binary that can handle data for a number of languages.

6.4.9 Supporting Local Conventions

Good character encoding is only half the battle - a program also requires functionality that observes language rules and cultural conventions.

Information about date, time, calendar, number, and currency format are varying across European countries. Many operating systems (e.g.

Windows) support these information and applications can request these information for any locale.

6.5 Conclusion

A number of important guidelines for developing Pan-European Software were introduced in this Chapter.

Design User Interface and Text translation needs a lot of attention as to present users with a consistent look, feel and functionality across different language editions of product.

Smart coding practices and eliminate compile dependencies achieve faster turnaround in the development, testing and translation cycle giving company the advantage to achieve more turnaround so more reliable testing and an error-free package.

7. Analysis of a commercial Pan-European Accounting Package

7.1 Introduction

The SunSystems product range has one of the most innovative designs of any accountancy solution in the world and was designed to be independent of environment and databases, giving users the opportunity to take advantage of the latest technological advances without having to change financial applications.

SunSystems is a comprehensive accounting package used in over 160 countries and available in 19 languages. Testing its compliance with the developed criteria to access Pan-European Financial Information system development would be a challenge.

This Chapter endeavors to test the compliance of SunSystems, one of the most innovative designs of accounting solutions with the developed criteria to assess PEFIS development

7.2 Company Overview

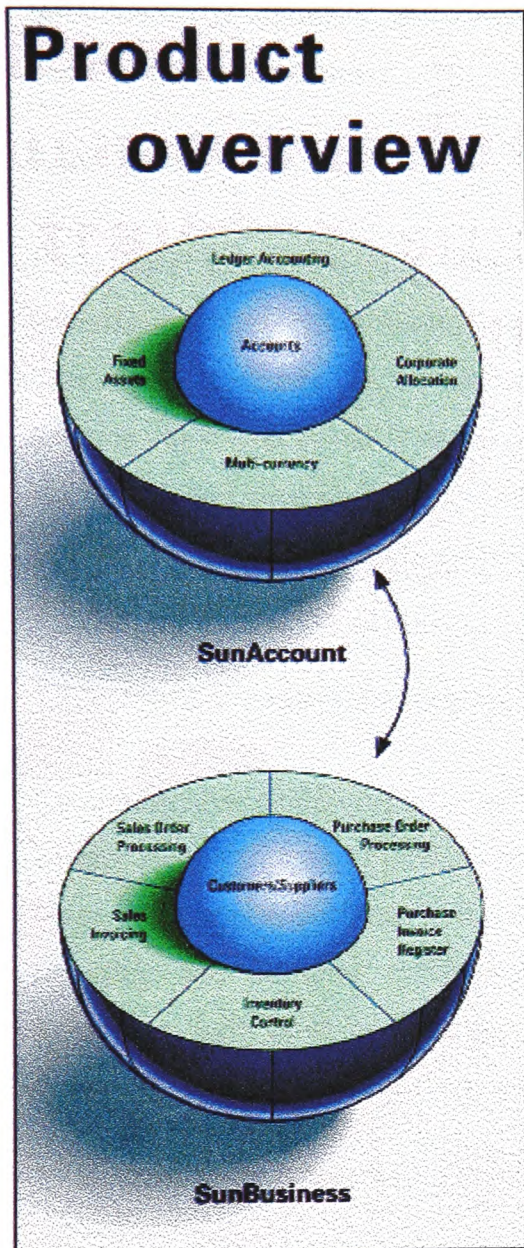
Systems Union was founded in 1981 by financial management and software experts with the vision to foresee that the business world of the future would require new dimensions of flexibility in business software. Today, many thousands of business around the world benefits from that vision.

System Union has successfully grown to one of the world's premier supplier of accountancy solutions for business with annual growth running at approximately 50%.

Today Sunsystems is used in over 160 countries and helps more than 9,000 organizations to meet a wide range of statutory requirements including GAAP, SSAP, FASB, IAS and countless others.

With many thousands of Sunsystems sites around the globe, the company's continued commitment to its founding philosophy, to provide customer-focused, highly innovative accounting business solutions, has been awarded the prestigious ISO 9000 certification, positioning it as one of the most reputable and successful suppliers of financial management software in the world.

7.3 Product Overview



SunSystems comprises two fully integrated product groups, SunAccounts and SunBusiness, which together tackle the full range of business challenges.

SunAccount consists of a fully integrated ledger system, a fixed asset register and an allocation module. SunBusiness is a sales and purchase order processing and inventory system. The design concepts behind SunSystems make it the most innovative suite of financial management software on the market today. SunSystems creates a database of information, which evaluates financial performance in every critical business area, improving the quality of information you receive about the organization.

7.3.1 SunAccount Ledger Accounting

All an organizations ledgers are updated simultaneously from one series of entries. Comprehensive analysis coding for department, product, project, division, company etc.

Simultaneously reporting achievable across all ledgers, accounts, accounting periods and analysis codes.

7.3.2 Fixed Assets

Fixed Asset Register is fully integrated with Ledger Accounting, thus applying powerful report writers to analysis of asset value and asset depreciation. Up to ten depreciation methods can be applied to each asset, for budgeting, forecasting, taxation value, and so on. With the addition of Multi-currency module, assets can be valued and depreciated separately in local and corporate currencies, with separate book value, asset life and depreciation methods.

7.3.3 Multi-Currency Accounting & Time Recording

Comprehensive Multi-currency module, available as an optional module with Ledger Accounting and Fixed Assets. Provides unlimited currencies within each ledger or account, performs currency transaction on entry and allows exposure reporting and currency revaluation. The same module can perform Time Recording, with multiple time rates, project costing, budget comparisons with combined time and cost reporting.

7.3.4 Corporate Allocations

Costs can be distributed across accounts, cost centers, projects, products, or other entities. The distribution can be based on static ratios, financial or statistical data. Allocation can be made within ledgers, across ledgers and across companies.

7.3.5 SunBusiness

Order processing and inventory system, combines all the elements needed for improving the day-to-day running of a business and integrated fully with SunAccount. Its ability to accommodate multiple currencies makes it perfect for large and multi-national companies.

7.3.6 Sales Invoicing

Define the invoice calculations with up to eight calculations per invoice line and unlimited invoice and credit note formats. Accounting entries can automatically transfer to the SunAccount Ledger Accounting module.

7.3.7 Sales Order Processing

Unlimited document formats for each stage of an order including order acknowledgment , picking , dispatch and invoice.

7.3.8 Purchase Invoice Register & Processing

Allowing control of purchase expenditure and invoice approval. Invoices can be entered manually, or matched against orders raised by Purchase Order Processing. Unproved invoices are held in an invoice register, and both these and approved invoices are optionally transferred to SunAccount Ledger Accounting.

7.3.9 Inventory Control

Gives control over inventory levels and inventory costs. Allocation of specific serial numbers or batches of inventory to the sales orders and issues entered. Physical inventory checking and variance handling. Maintains multi-currency item cost. Comprehensive accounting information for all inventory movements passed to SunAccount Ledger Accounting.

7.3.10 SunQuery Report Writer

Transaction level report-writer which allows to construct your own reports from detail records stored by SunAccount and SunBusiness, with complete freedom of data selection, report layout, sorting and totaling. Reports can include customer ageing by overdue amount, transaction listing by analysis code, products

catalogues or price lists. More complex report layouts are painted on the screen by the REPORT option. Produces simple graphs.

7.4 European Features in Sunsystems

7.4.1 Portable

Sunsystems runs on a variety of machines, operating systems and databases. Organizations have a choice of platform that suites their business needs. Comprehensive data transfer facilities enabling consolidation and data sharing.

Choice of Environment

- Client/Server - MS SQL Server, Sybase, Oracle
- Stand-alone PC's and Networks - Windows 3.x , Windows 95, NT
- UNIX Systems
- VMS, Open VMS and OSF

7.4.2 Scaleable and Flexible

The parameter driven structure of Sunsystems makes it suitable for a wide range of organizational complexities, allowing the implementation of a corporate standard and improved resource management. The ability to finely tailor Sunsystems without customization enables the software to match the processes within a business very closely, reducing implementation time, training and operational upheaval.

7.4.3 Transfer Layouts

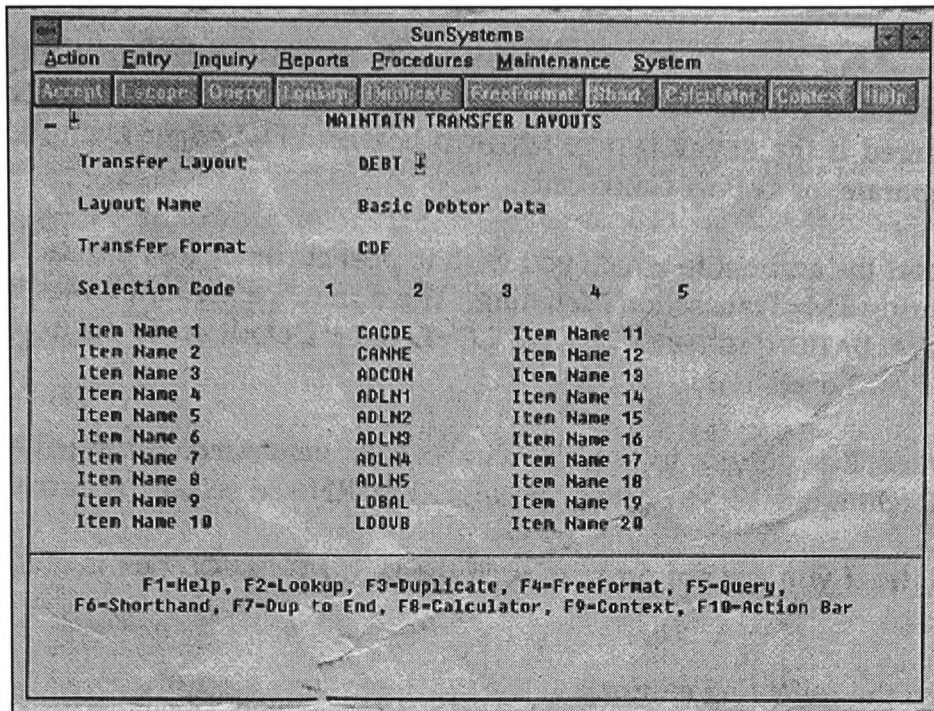


Figure 7-1 : Sunsystems Maintain Transfer Layouts Screen

Sunsystems is supplied with consistent, fully audited interfaces allowing the development of integrated solutions with third party products without programming. Allows the import and export of reference records, or to, a file. The file, which is imported, does not have to be generated within Sunsystems, but can be any text file presented in the correct format.

Open Access to Data

- SQL and Btrieve Data Access
- Powerful Import Routines
- Export to Office Products e.g. Microsoft office
- Interfaced to many other applications

7.4.4 Security

For more than ten years, Sunsystems has developed a following of some 9,000 organizations providing new clients with the peace of mind that they have selected a reliable, stable solution. Coupled with the security of a proven audit trail, a comprehensive access profile system and the fact that the single ledger design of SunAccounts ensures that all crucial business processes are completely secure.

Security Audit Control

- Access Permission Groups
- Password Control
- Access Permission by Function/Company/Account/Value
- Full Audit Trail

7.4.5 User Interface

Sunsystems has an easy-to-use, interface which allows to navigate directly from any part of the system to any other, either through pull-down menu options and button bars or, for more experienced users, by employing hot keys. Furthermore with the security system only showing the options the users have access and the choice of graphical or character based interfaces, Sunsystems is simple to both learn and use.

7.4.6 Translation - Multi-lingual

A multi-lingual license allows operators to choose which language version they prefer to work with.

Multi-lingual processing implies that on an English language version in French, you can have operators using a French, Spanish or German system. The data is

easily accessed from any of these four languages, regardless of the language in which it was originally created.

Similarly, if the company is based in Paris with a network version in French, you can have operators in London office work on the live system on English, and operators in Frankfurt running in German.

7.4.7 Multi-Currency

Each of the Sunsystems modules supports full multi-currency processing. SunAccounts currency translation is automatically performed against pre-defined tables saving the trouble of identifying and keying the relevant rate.

Multi-Currency Entry

- Flexible entry
- Average , Closing or Spot Rate
- Conversion Rates up to Nine Decimals
- Currency 0,1,2 or 3 Decimals

Multi-Currency Reporting

- Report in Base Currency or Other Amount
- Gain, Loss or Exposure by Currency
- Multi-Currency P&L and Balance Sheet
- Consolidated Reports

Comprehensive Processing

- All Accounts Multi-Currency
- Unlimited Number of Currencies Per Account
- Settlement and Unrealized Gain and Loss
- Selective Revaluation

7.4.8 Locales and Internationalization

“Think globally but act locally”

Sunsystems has network of offices and SunCenters in over than 90 countries to support users. It stays close to customers through consultancy services, user forums, seminars and newsletters. They teach but they also learn from users.

They offer training on subjects wider than just merely product, but also laws, customs and regulations that govern local business operations.

Sunsystems support a large set of locales and cultural conventions and is always update-to-date.

7.4.9 Reporting Compliance

Sunsystems is very aware of GAAP, SSAP, FASB, ASRB, IAS, EC statutory requirements and its systems support a wide range of them. It has an International flexibility and industry commentators around the World.

Document Definition and Statement Layouts module of Sunsystems allows the user to:

- Design his own documents including statements, remittances, and cheques

Figure 7-2 : Sunsystems Maintain Statement Layouts

- Select a number of standard formats supplied with the system
- Design Management Reports
- Design Financial Statements (Profit & Loss, Balance Sheet etc.)
- Design Daily, Monthly, Yearly reports
- Use Predefined-columns
- Define columns that are calculated based on other columns
- Show either base amount or other amount
- Report the movement in foreign currency
- Report the outstanding (exposure) balance in each currency
- Use conversion Rates
- Import and Export report

7.4.10 Software Developers

Today, over 100 software developers around the world are producing products that complement Sunsystems financial software. SystemUnion as the developers of Sunsystems, continuously dialogue with developers, providing them with the information necessary to allow their products to remain current with the latest version of Sunsystems. To meet the needs of developers, Systems Union has created *the Sunsystems Developer Group (SDG)*.

Members of this program are independent developers, resellers and customers who have a professional development capability.

7.5 A Criticism of the Sunsystems Package

7.5.1 Deficiencies

7.5.1.1 Screen Layout

- Functions Keys at the bottom of the screen always displayed even though does not applied to some cases.

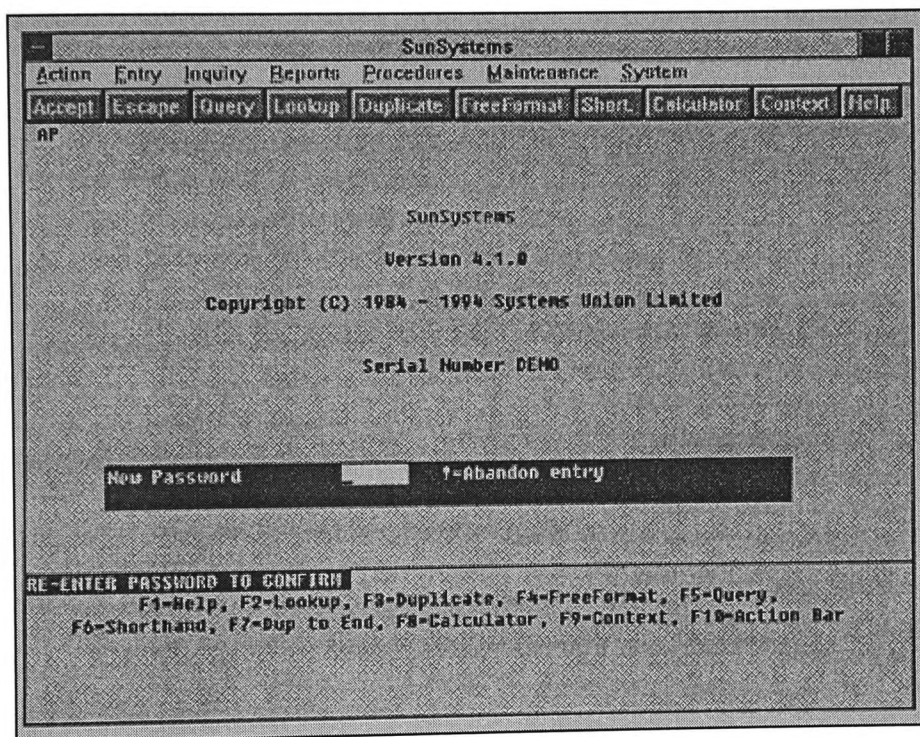


Figure 7-3 : Sunsystems Password Screen

- Heavily use of Abbreviations options may cause confusion.

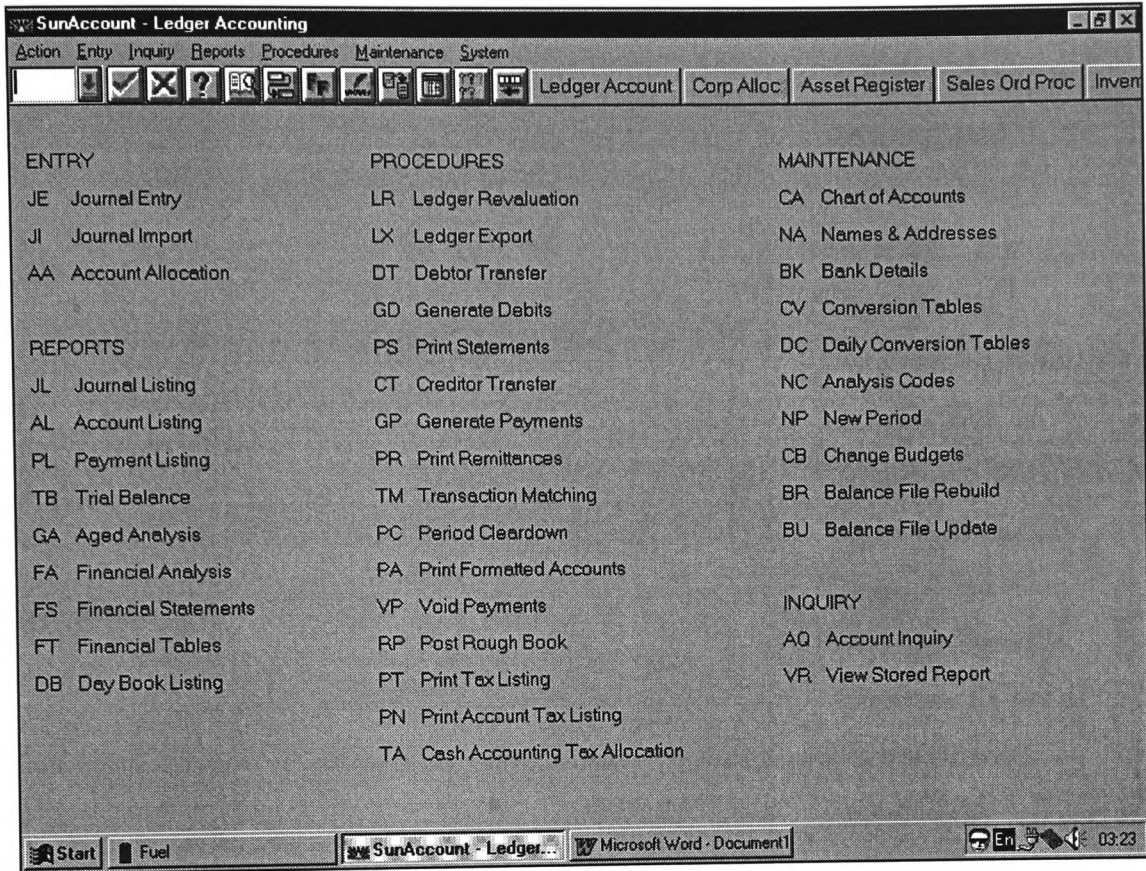
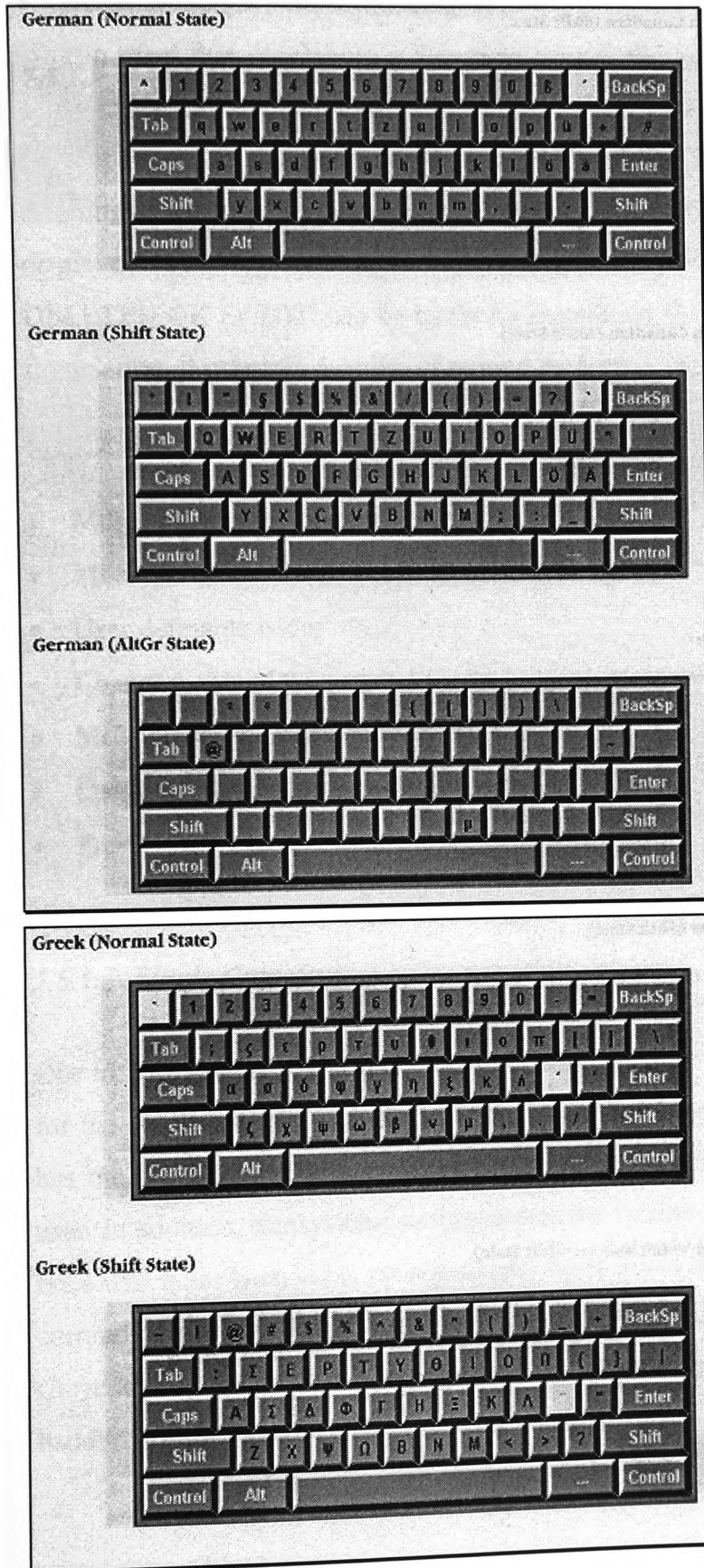


Figure 7-4 : Sunsystems Ledger Accounts Main Screen

- Obvious or clear things not necessary to mentioned. Avoid superfluous information.
- Shorten version of name is a good facility



- Some of the options does not have the appropriate key in the keyboard layouts of some countries. For instance the German Keyboard Layout look almost the same as the Greek but the signs < and > are missing from the German. So use of <, > will not applied in Germany.

Figure 7-5 : Keyboard Layouts

- Better Messages - More meaningful

Bare in mind that developing a European system the assumption of obviousness does not applied to all the cases.

Use of more explanatory messages. The message “DELETING” is a meaningful message but can be more explanatory if the current record deleted displayed. A message that used a lot by Sunsystems “ENTIRE RANGE WILL BE DELETED OK (Y/N)?” can be better by mentioned the range of records marked for deletion. It prevents deletion of needed records.

7.5.1.2 No restrictions , No Limits

- More ageing periods may needed
- More T’s analysis may needed
- User definable codes
- Change a part of the screen to include more information
- More powerful Formatted Layouts tools
- Language Definition is not so powerful
- Free format macros

7.5.1.3 Single Currency

Due to Sunsystems strong multi-currency functionality, many of the requirements for the single currency are already being met. For example, Sunsystems already has the functionality to convert to any reporting currency required by the end-user. In addition, Sunsystems accommodate the facility for expressing conversion rates which has been set at six significant digits. Even though Sunsystems can not currently handle full dual-base currencies. The package is not ready for Single Currency but the company promises that by 1999 it will have a full and flexible handling of the Euro.

7.5.2 Suggestions of Improvement from a Pan European Viewpoint

7.5.2.1 Operators Buttons

Buttons allow the automation of certain tasks. For example to program a button to take you to a certain screen, which is quicker than typing the appropriate code is selecting the pull-down menu.

Any of the function keys used can be assigned to operator buttons. For example you can create a button that is linked to F2, when the operator clicks on this button the <LOOKUP> facility is automatically invoked.

The operator button is better to define for each operator. And preferably to appear across the top of bottom of the screen. One set of buttons appears for Sunsystems but is not enough.

7.5.2.2 No Limitations and Restrictions

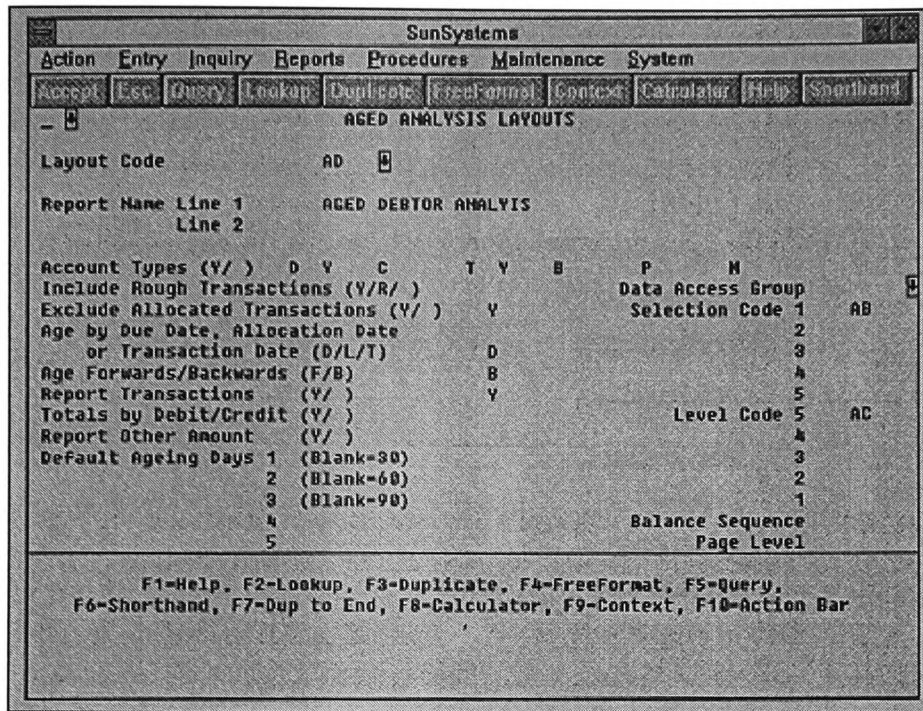


Figure 7-6 : Sunsystems Aged Analysis Layouts Screen

Give the ability to user to define the maximum characters of some important fields. For instance transaction analysis and account analysis are by default 50 characters. Many companies may need less or more space for these. If the corresponding field does not fit into screen display only the fitted ones but allow the user to input and view the rest.

7.5.2.3 No need to crowd screens

Some of the screens of Sunsystems are over crowded as a result, efficiency and smoothly recording of information to suffer (limited).

Sunsystems in some of its screens, in order to solve the problem of the crowded information on the screen they use the OVERLAY option. This option just changes the right side of the screen and display extra information. This is not the perfect solution.

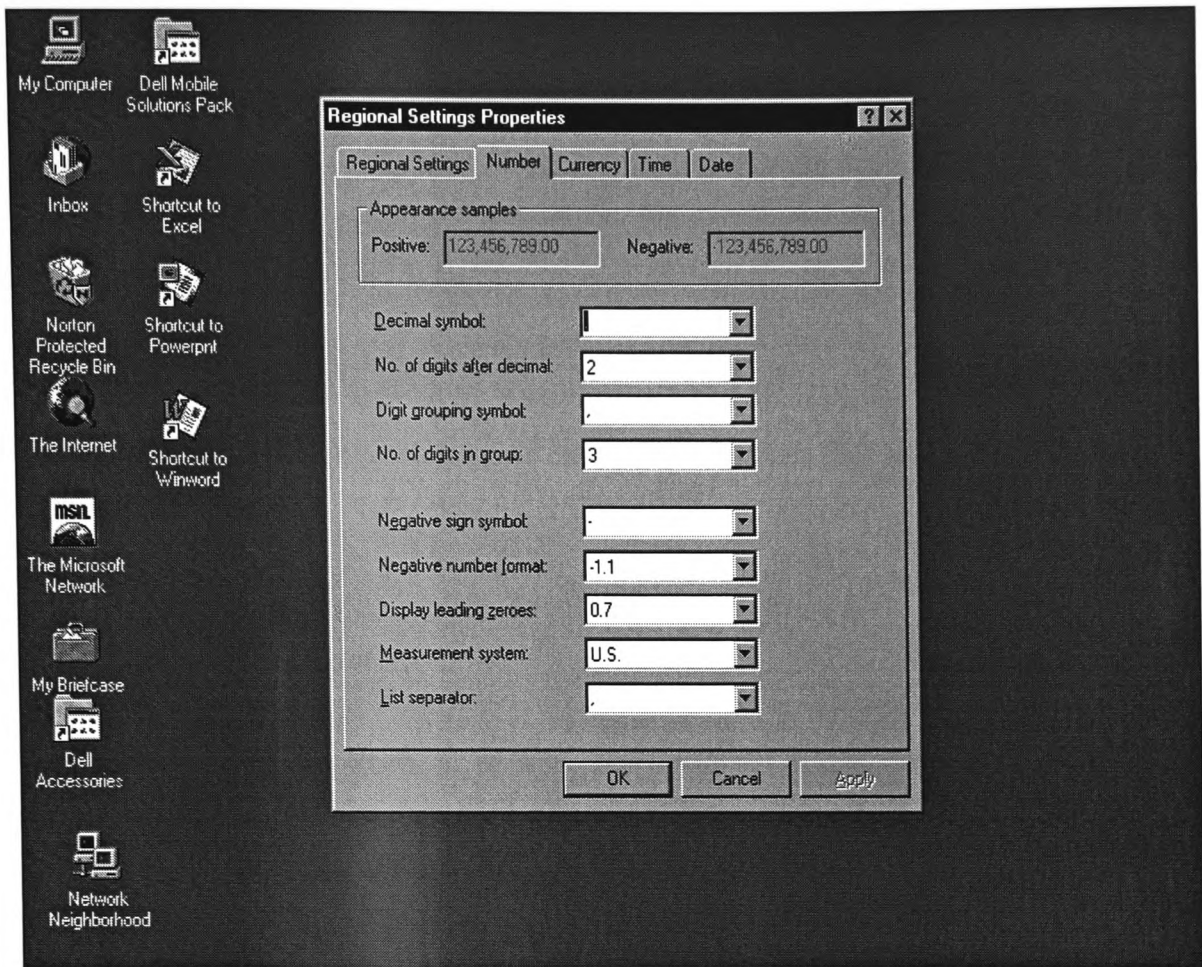


Figure 7-7 : Windows 95 - Regional Sorting Properties

A suggestion to this, is the usage of the title bars, a technique that Microsoft effectively accommodated. A method that always enlightened. Sunsystems is suggested to use more menu bars, status bars toolbars, title bars and dialog boxes as to allow text to increase. Compare to other systems Sunsystems leaves the required space for translation increase.

Have in mind the golden rule of European issues; “The length of text often grows when it’s translated”.

7.5.2.4 Keyboard Layout

One of the special features of Sunsystems is to use an alternative code for some options. One reason is to help users when don't remember the main code. But the main reason is to solve in some degree the problem of keyboard layout variation in Europe.

Although this technique applied by Sunsystems is proven working, some times it causes confusion. It is suggested to use combination of keys that are more widely in Keyboard Layout.

7.5.2.5 Mouse Navigator

Use mouse navigator when is needed. For instance in the main screen of SunAccounts even though the user has the option to select the program wanted, by input an abbreviation of the system or by the using the title bar, the use of mouse as a selection mechanism in more cases is more effective.

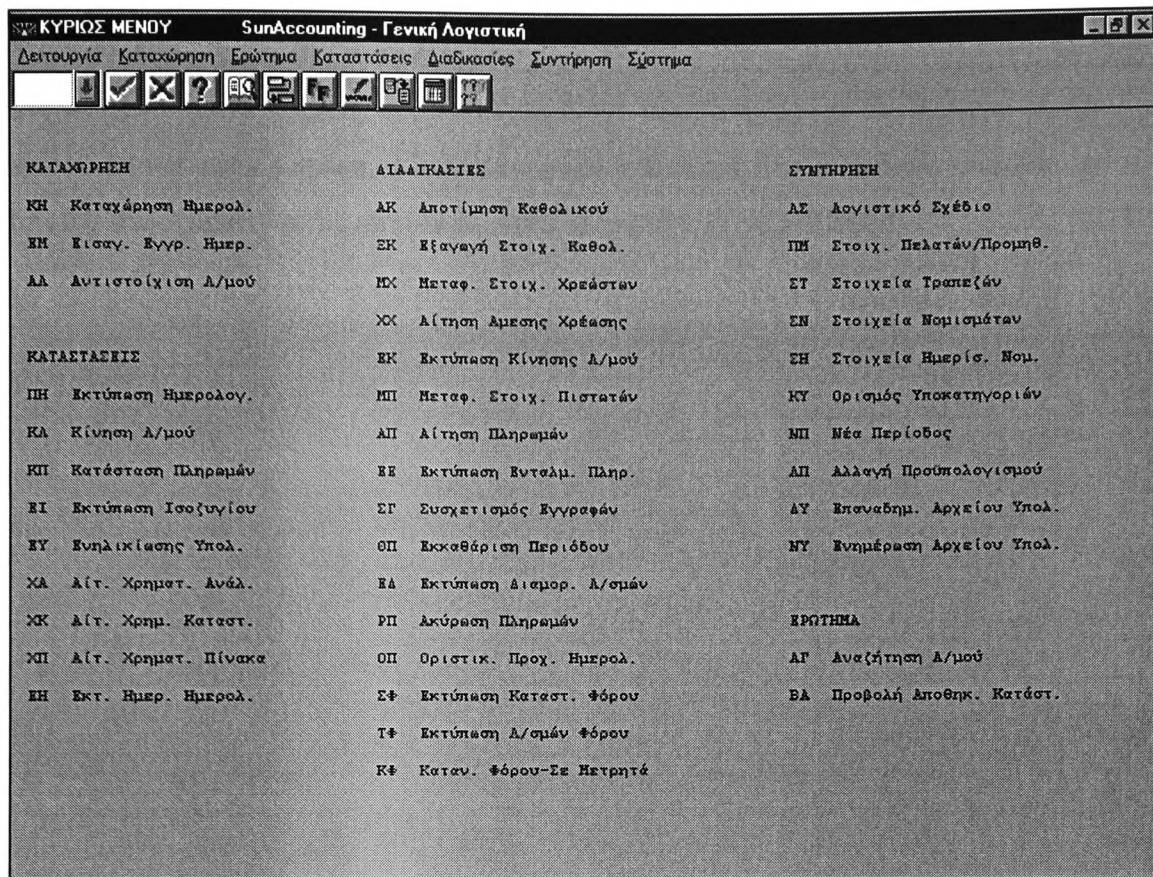


Figure 7-8 : Sunsystems General Accounting Screen in Greek

7.5.2.6 Use a Auto-Hide Taskbar

Instead of always display the Function Keys functionality in the bottom of the screen and occupy a space, it is better to use a Taskbar like Windows uses and by having the property to be auto-hide, save of space will be achieved.

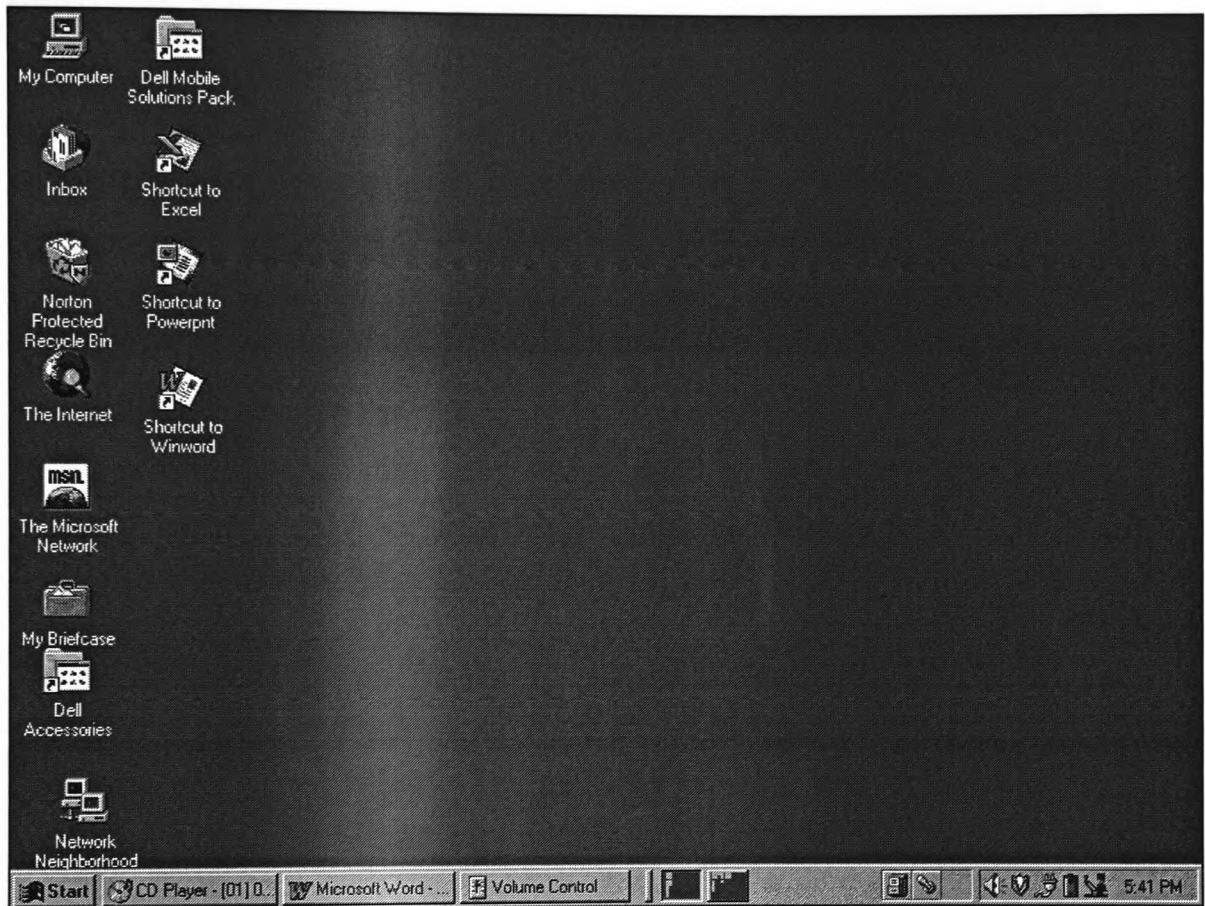


Figure 7-9 : Windows 95 - Main Screen

7.5.2.7 Single Currency

Systems Union has announced its strategy to ensure Sunsystems will answer all requirements for the introduction of a European single currency. From 1999, Systems Union will provide all of its customers with the functionality to enable full and flexible handling of the Euro.

In addition, to support customers in their transition plans and in the actual conversion itself, Systems Union will provide a comprehensive package of Euro services and facilities for consulting and training.

Users will be able to add the Euro in the same way as any other additional new currency as Sunsystems has true multi-currency functionality throughout the whole system.

A new functionality to be added to Sunsystems is suggested as to enable users to:

- Handle full dual-base currencies enabling the maintenance of one or more reporting currencies
- Handle both currency and volumes, weights or other units of measure
- Invert base and reporting currencies giving easy inflation adjustment (of particular value in high-inflation markets such Eastern Europe).

7.6 Conclusion

SunSystems has earned three “Best of Class” designations for its financial management software, for best value general ledger, best multi-currency and best built-in report writers.

Testing its compliance with the developed criteria it showed that even comprehensive accounting packages have limitations and restrictions (overcrowded screens, key combination that not exist in all keyboard layouts).

In this Chapter suggestions for improvement are given from a Pan-European Viewpoint.

8. Survey on Pan-European Software Development

8.1 Introduction

The survey consisted of a questionnaire (See Appendix A) that was circulated to a large number of European software development companies and consultants.

The primary intention of this survey was to collect information regarding some of the important aspects of Pan European Financial Information System design.

The questionnaire was sent to companies by:

- *Fax*

Fax method was considered the fastest way.

- *Personal contact*

Ensure commitment that companies returned the questionnaire.

- *E-mail*

The chances of getting an E-mail responses are greater than Fax method for gathering information.

There was a consideration to send follow-up letters or follow-up calls to non-responses after two weeks if the responses were very low. The responses rate can be considered satisfactory therefore no follow-up has been made.

The questionnaire was divided into ten questions. The respondents were asked to tick or circle around the options on the questionnaire sheet. Space was provided for each question for some other information, which have not been provided amongst options.

Question one through four was included to identify the types of applications, platforms, languages and methodologies used by the companies to develop their packages.

Question five tried to categorize companies in three major categories based on their operational market (1. Worldwide , 2. Europe , 3. Local)

Question six and seven were illustrated the companies views and beliefs concerning PEFIS development.

Question eight pointed out some of the basic features of a European system that companies systems must comply and asked companies whether their system satisfy these criteria.

Question nine tried to figure out the effect of European Monetary Union on companies systems, how companies are aware of , and what measures they took to face it.

Question ten indicates the increasing movers towards the European Market.

8.2 Response Rate

The final rate of responses was 34%. 150 questionnaire have been sent and 50 responses answered back.

The questionnaire was intended for senior staff (Managers, Supervisor etc.) involved in the development and planning of Pan European Projects. This have been confirmed by the respondents answered back (99% of the respondents were filled by the manager of those companies).

Due to that, the response rate was not so high, but it was higher than expected. Managers or senior staff has more interest in potential new development.

8.3 Methodology

A questionnaire was sent out to 150 companies involved in the production of Pan-European software. Its purpose was to glean information regarding some important aspects of PEFIS design.

Rank in order of importance these are:

1. Type of Applications developed
2. Target Platforms
3. Methodology used
4. Implementation language used
5. Market focus
6. Existing Pan European products
7. Feasibility of PEFIS
8. Feature of PEFIS
9. EMU impact
10. Future Planning's

The results of the survey reflect the views of a number of important software developers/providers that have a leading role in providing financial systems across Europe.

8.4 Analysis of Questionnaire

8.4.1 Type of Applications developed

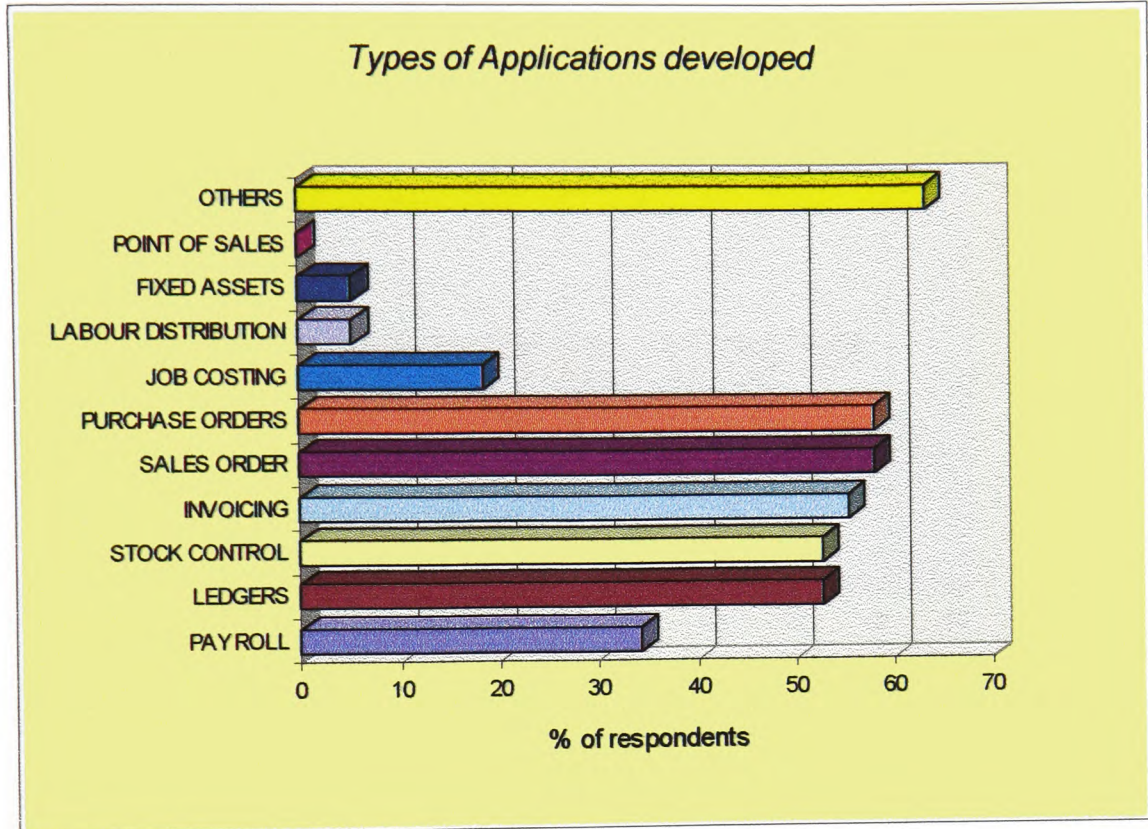


Figure 8-1: Types of Applications developed

In general all Financial Information systems are widely distributed. It appears that companies are not fully exploiting Pan-European Fixed Asset, Point of Sale and Labor distribution systems yet.

The results also show that the big companies focus on commonly used applications such as Invoicing, Purchase Orders, and Sales Orders. Interest in small systems does not appear to be large.

8.4.2 Target Platforms

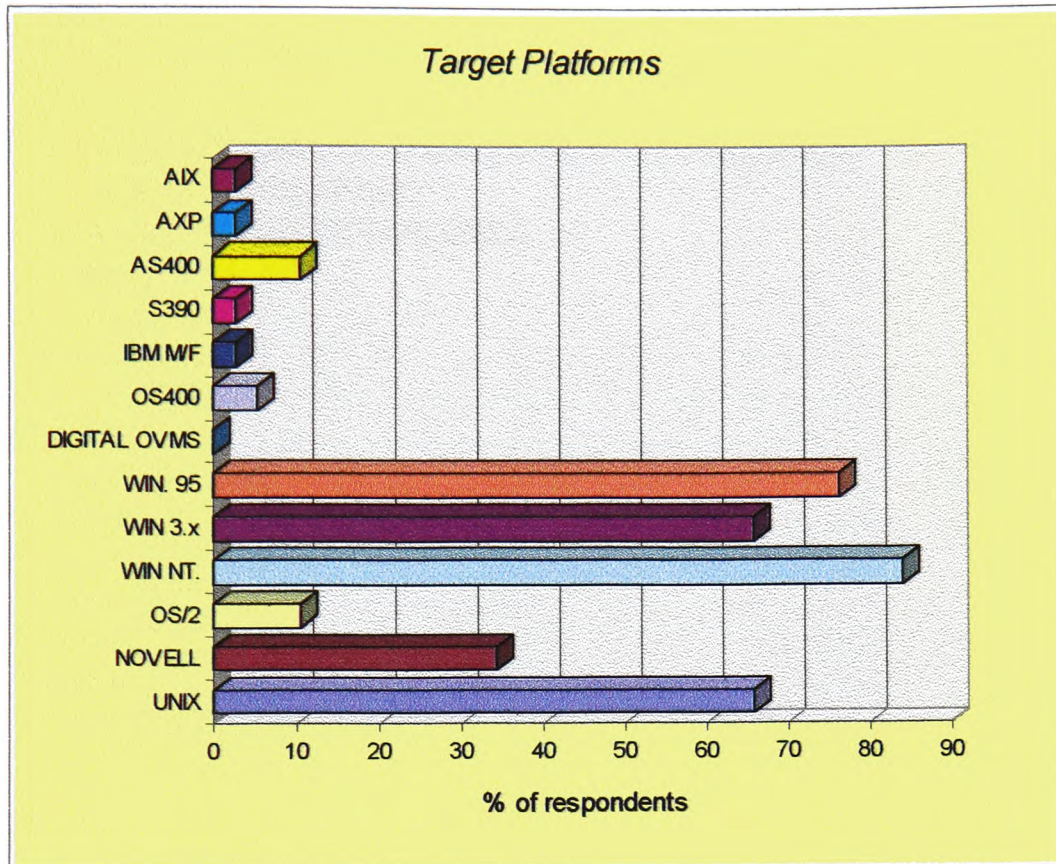


Figure 8-2 : Target Platform used

Microsoft Windows 95 and Win NT show an upward trend. Also UNIX is improving with a percentage of 68%.

It is obvious that companies developing systems are having in mind the target platform that their systems will be used. Win95, Win NT and UNIX are at the same percentage of use because the majority of the packages in Europe designed to comply with the most popular platforms.

Platform like AIX, AXP, AS400, S390 are not so widely used even though they are huge companies like ROSS ASSOCIATES, SAP UK, and JBA that support them.

Novell and OS/2 appeared to lose their competitiveness compare to the other Operating Systems.

8.4.3 Methodology used

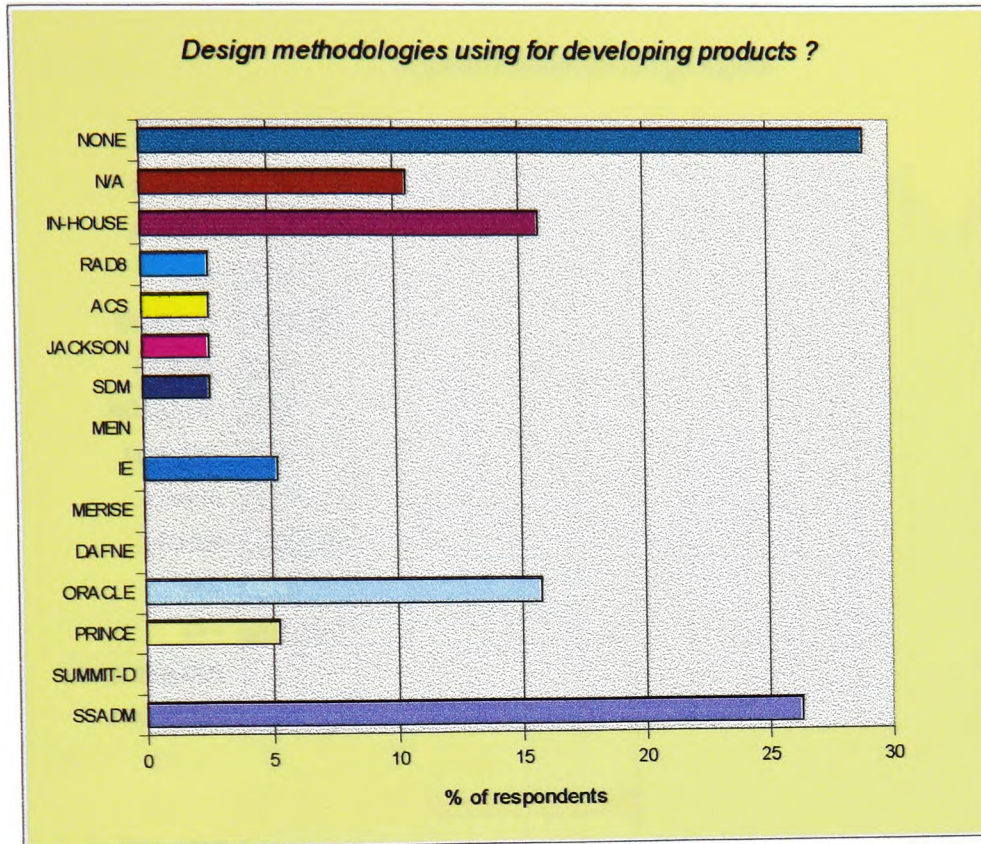


Figure 8-3 : Design methodology for developing products

System SSADM is clearly ahead of use for developing products with 26%. Oracle is slightly behind with 16%. All the other design methodologies except from MEIN, MERISE, SUMMIT-D are at percentage of 5%.

Combinations of the design methodologies are used by many companies. 16% of companies have their in-house methodologies. Methodologies tend to be similar to each other so by combine some of them will not influence the outcome of the design.

It is apparent that new methodologies are evolving however they have not as yet a significant share in the European market.

8.4.4 Implementation language used

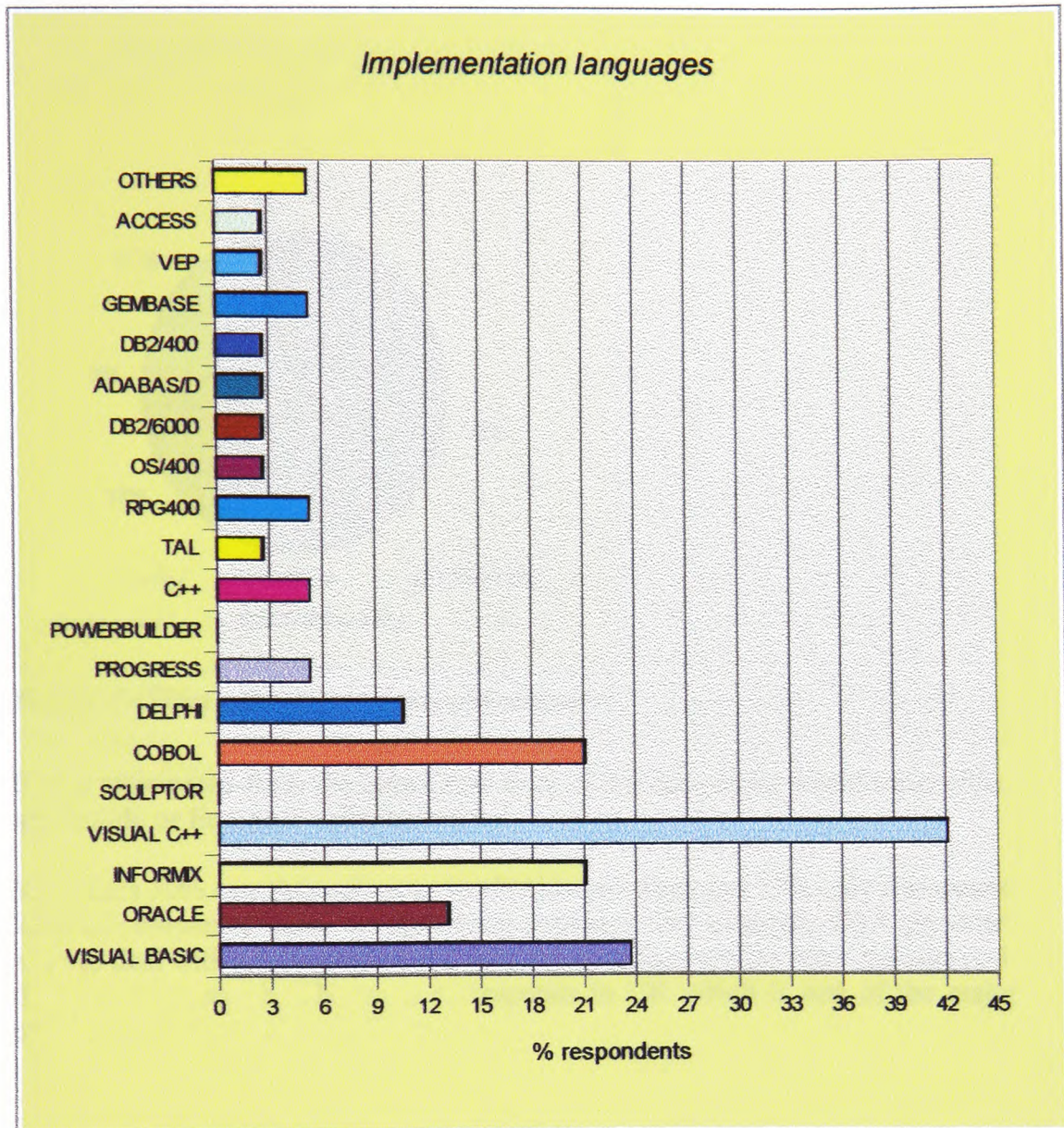


Figure 8-4 : Implementation languages used

Visual C++ is the most commonly implementation language of developing products. A percentage of 42% shows its dominance. Visual Basic is becoming very popular.

COBOL retains its market share with 20%. A traditional language that is still preferred by many companies. Delphi and Oracle have a significant share with 13%.

It is noticeable that companies use more than one implementation language.

8.4.5 Market focus

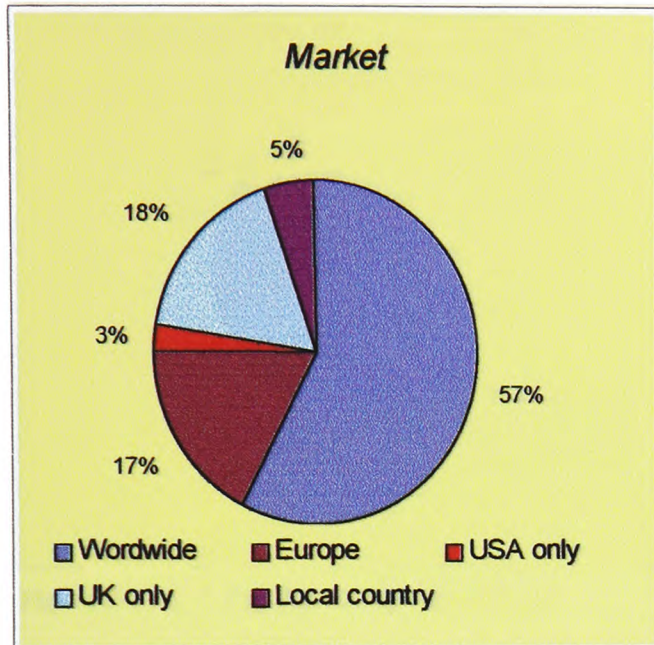


Figure 8-5 : What is the Market of surveyed companies

It was anticipated from the outset that most of the companies would serve either worldwide or European software market.

More than 50% saw themselves as worldwide providers and 17% only Europeans. 25% of companies focus on their local countries. For example, USA providers have to deal with a huge market and may not need to extend to other markets until they get big enough. The same corresponds to UK which is one of the major providers of IT s services in Europe.

8.4.6 Existing Pan European products

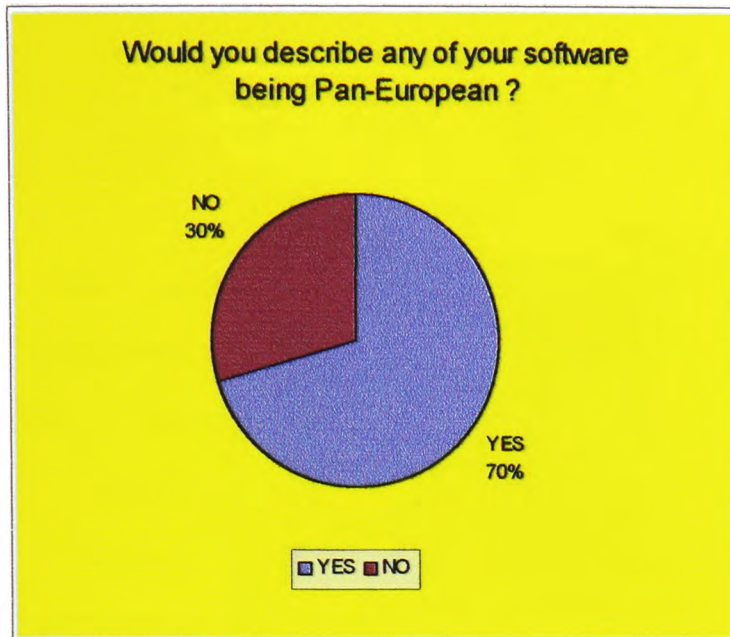


Figure 8-6 : Existing Pan-European products

When were companies asked if their systems could be described as Pan-European. The majority of responses indicated a clear belief that these systems were Pan-European. (72%)

8.4.7 Feasibility of PEFIS

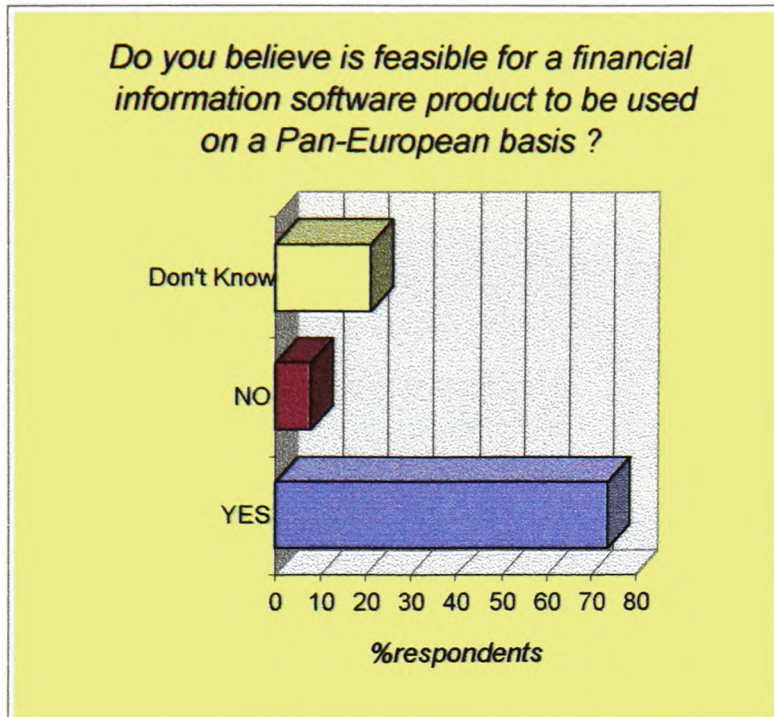


Figure 8-7 : Feasibility for a financial information software to be used on a Pan-European basis

When asked about the feasibility of Pan-European Systems, companies were asked firstly, if they call their system Pan-European. A percentage of 28% said No. Asked if they believe is feasible to develop such a systems only 8% said “No”. Many companies that described their programs as not-Europeans they have the opinion that such a system can be developed.

More than 70% of companies included in survey based on their experience concluded that PEFIS design is feasible.

8.4.8 Features of PEFIS

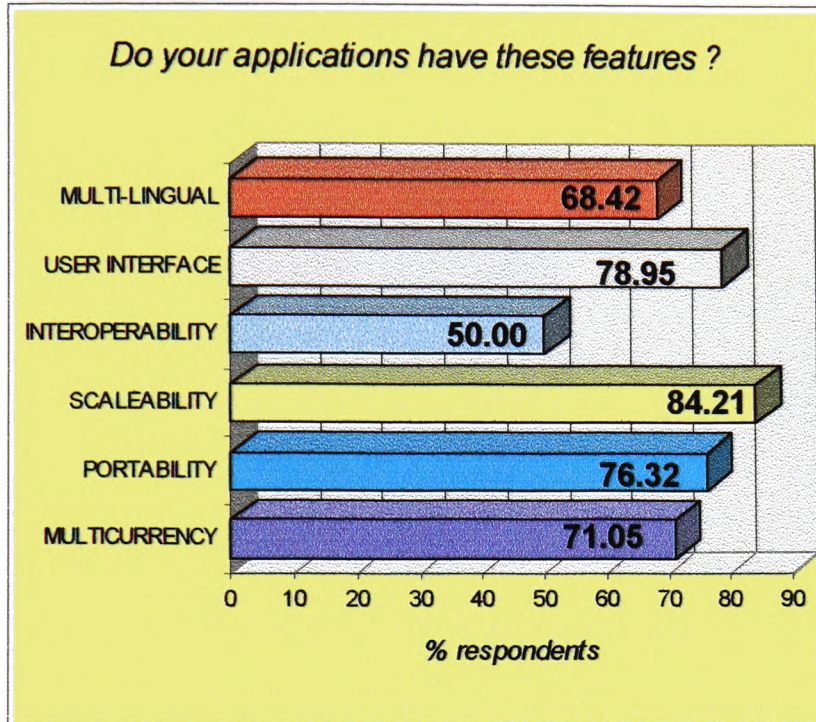


Figure 8-8: Feature of PEFIS

Multi-lingual, User Interface, Interoperability, Scaleability, Portability and Multicurrency are some of the basic features that a PEFIS at least must comply with.

Interoperability (50%) is the only aspect that companies do not fully satisfy. All the others are in a very good state. Systems that are not complying with these basic features have no future in Europe.

8.4.9 EMU impact

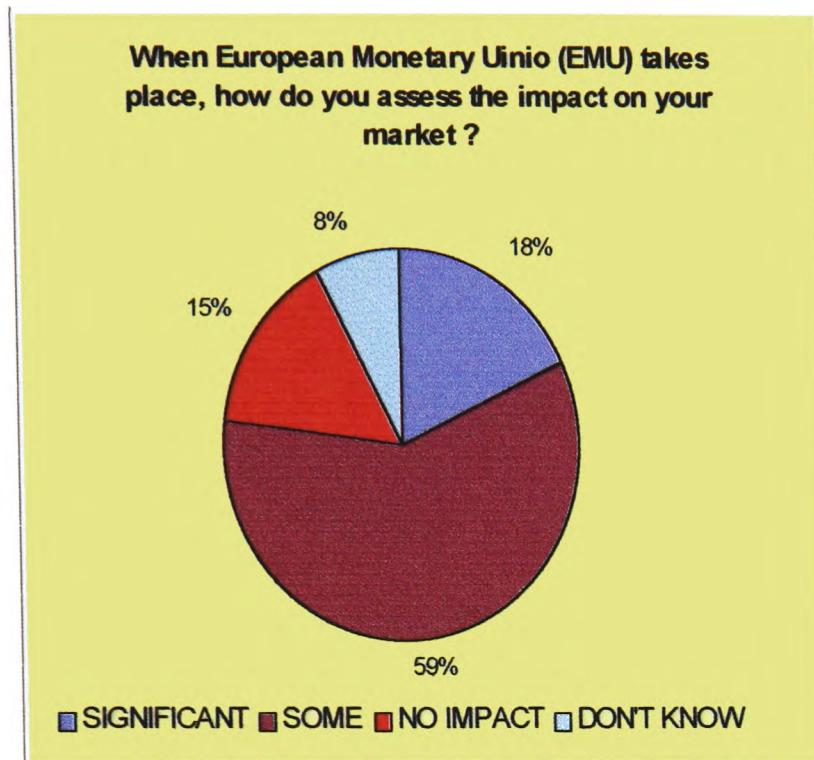


Figure 8-9 : European Monetary Union Impact

The advent of EMU definitely will have an impact on the major packages have to deal with finance. 74% sees an influence on their systems and only 15% describe it as significant.

A small percentage of 8% would expect no impact. e.g. Companies that develop educational programs and have nothing to do with money they do not have to worry about EMU.

Even EMU has received widespread coverage in the media a percentage of 8% feel unaware about the impact on their systems.

Companies which are first to prepare themselves will reap the greatest competitive rewards.

8.4.10 Future Planning's

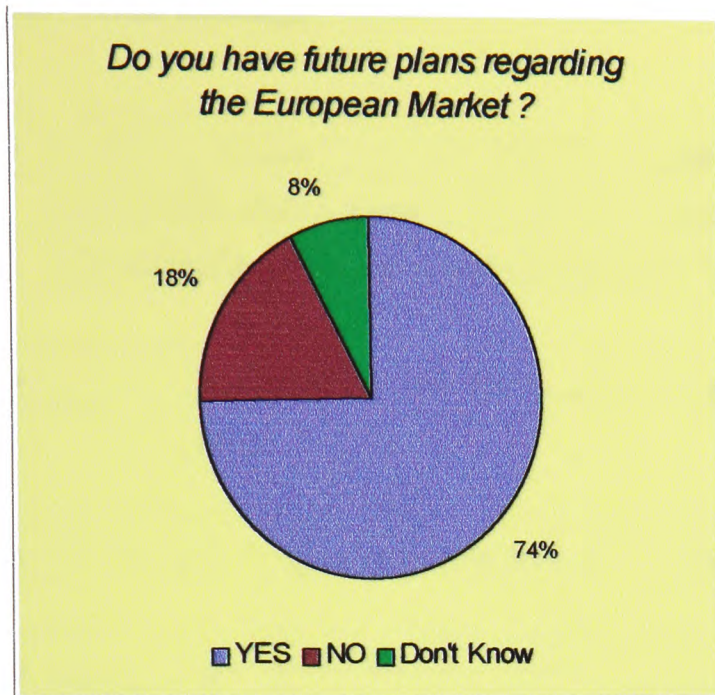


Figure 8-10 : Future plans regarding the European Market

Asking whether a future plan regarding the European Market is planning, 74% answered YES, 18% NO, and 8% do not decided yet. Companies that have no plans for European Market are those focuses on their local market.

8.5 Main findings

- In all the sectors surveyed, European software companies welcome the development of Pan European financial information system. 70% strongly believed that development of such systems were feasible.
- It became apparent that very few platforms (e.g. UNIX, WINDOWS NT.) were evolutionary.
- Design methodologies varied. No definitive methodology was apparently used.
- Survey shows clearly the emergence of Visual C++ as an implementation language (42%)
- 75% of software developers/providers describe their products as Pan-European
- Despite the overall belief that the development of PEFIS is feasible, 20% developers appear to have no interest.
- Asked to evaluate the compliance of their products based on some basic features of PEFIS, the vast majority answers positively.
- Regarding EMU and single currency impact on software packages, 18% felt that would have a significant impact and 82% do not know yet, or do not start think about it..
- 74% of respondents had future plans regarding the European software Market.

8.6 Conclusion and Initiatives

The European Information Technology Observatory (EITO 96) has carried out similar surveys. In almost all the sectors surveyed there is compliance with EITO 96 surveys. EITO 96 cites UNIX as being the emerging platform and Visual C++ dominance as an implementation language. It also mentions the degree of the European Monetary Union effect on the European software and the IT market in general.

There still a diffusion of design methodologies. Most companies use their own design and development methodologies which at best is a combination of other methodologies; For this reason the European Commission has funded Euromethod as an attempt to provide a standard methodology; an Umbrella for the existing methodologies and not another new one (Paul Turner, 1996).

Many Companies advertise their software as Pan-European and most indeed do comply with PEFIS requirements to some extent. However very few of these packages have full compliance when compared with the criteria put forward for the Pan European system discussed in Section 3.

Based on the survey finding, it appears that most companies have a strong experiential belief that the development of PEFIS can be achieved. Microsoft for example names many of its products Pan-European/Global.

Companies have planned to expand their vision to the European Market. This appears to be a general throughout the industry. A recent survey of Coopers&Lybrand (Communication Renaissance, A European survey of the information superhighway and multimedia, 1995) shows that Europe still lags behind United States in software development, however, a window of opportunity still exists and there is a belief that Europe will rapidly accelerate its current rate

of progress to avoid losing out. Therefore forward planning in this area must be a crucial requirement.

Significant lack of awareness of the EMU was also revealed by the survey. This lack of awareness, combined with an admitted confusion of perceived Year 2000 Millennium will make things even worse and if no proper planning is carried out many companies will fail retain their position to market.

9. Summary

Across many industries, companies are becoming increasingly globalised and mergers and acquisitions are commonplace. The need is growing for more accurate and timely management information, to give top management the information they need to run the business. Companies want to unify their information systems by using a common system. The pressure from PEFIS comes from many areas; from those who regulate; from those who prepare and use financial statement multi-nationality.

In order to achieve these goals many companies are going through business process re-engineering exercises, which require far more flexible software solutions. Companies seek for flexible designed packages that can be adapted to the particular way in which each company works.

During the last few years the packaged software market has undergone some of the most significant changes in its history. Probably the most significant change is the mover from proprietary to Open Systems, which is in turn driving most of the other changes. Open Systems include operating systems like UNIX, or networks like Microsoft NT and Novell, in comparison with the old proprietary systems and various mainframe systems.

For the prospective buyer of packaged software there is both good and bad news. On the plus side, the potential benefits of selecting the right software and implementing it correctly have never been greater. On the minus side, the range of packages on offer makes selection an increasingly difficult task.

“The use of European software is the only way to survive in the future” (Bruno Lamborghini, 1997). The basic requirements of Pan European Information System (PEFIS) defined in Chapter 5 clearly shows that such development is complex. Many European software developers boast the inclusion of many Pan

European features in their systems but one has only to carefully look at what lies beyond the marketing blurb to find that this is not always the case. It is safer therefore to assume the package does not comply to PEFIS criteria until you have confirmed for yourself that it does what it claims to.

A software house in order to develop a PEFIS must first re-organise its product team in order to consider all the factors that influence the development of such a system for example, EU regulations, local requirements, keyboard layouts, coding standards etc. The ultimate goal of this team is to consider European issues during critical feature design and coding designing stages. Market forces, usability tests, and development constraints, which also affect the overall design of the product.

All product members must be responsible on European issues; hold all the members responsible for the functionality of the whole system. This will save time and effort in the future and will easily resolve later problems.

The golden rule for designing a PEFIS is that all language editions share the same core source files. Each language edition should have its own localized resources that can not be part of the core. Separating the core from localised resources helps software houses to write European code. All the differences between countries are inserted to their corresponding resource file. Chapter 4 (*Criteria to access PEFIS*) provides techniques and guidance to achieve limited differences between countries with the use of smart code practices, meaningful images, symbols, pictures and texts.

The survey described in Chapter 6 shows there is a dominance of Visual C++ as implementation language, this concurs with the EITO 96 (Paul Turner, 1996). Also no developers appear to apply a standard methodology to the development of software, and that is why PEFIS is deficient in terms of standardization. Moreover, SSADM was shown as the most common methodology. It is also clear that most companies have a strong experimental belief that the development of a

PEFIS can be achieved nowadays and almost all the companies surveyed have some European prospective. Significant awareness of the European Monetary Union (EMU) is also revealed from survey and this will may make matters worst due to possible confusion about related issues.

Development of PEFIS in the last decade years is characterized as an ambitious task, nowadays it is a general belief by almost all companies that the goal of PEFIS is achievable.

It is undoubtedly clear that the emergence of Open Framework is causing rapid changes in technology. The availability of Open software Platforms like Windows, or UNIX, and of graphical user interfaces, enable a more efficient communication between different I.T sources (Paul Turner, 1996).

There is a great movement towards package solution and a movement away from custom or bespoke software. Internal development departments are more and more competing against independent software providers. In a major users survey in the four main European Countries (Germany, France, United Kingdom, Italy) it was found that around 44% of users expected an increase in their investment in packaged software (Paul Turner, 1996).

Furthermore there is a trend towards outsourcing due to the lack of internal sources, skill and cost as to keep in pace with the I.T Market evolution.

The European Banking and Financial Systems continues to be restructuring. In 1991, with the signing of the European Union Treaty in Maastricht, the community made fundamental changes of historical importance in the institutional, political and economic sectors. This is currently having an important effect on payment and interbanking systems.

The debate on European Monetary Union is continuing and no doubts as regards the introduction of European Currency Unit (ECU). This could encourage companies to become increasingly active in the member states. However the developments in this area will certainly affect the development of financial information systems. As single currency legislation is phased in, will be an obvious need for other European countries to adopt PEFIS.

Many software houses advertise their systems as Pan European. It is apparent that something forces them to do so. This investigation of the current extent of software and services in terms of the market, software products, professional and technology trends across Europe give a clear picture which Everything shows the declining belief that harmonization and standardization of accounting are no longer an option, but a major challenge that has to be won.

APPENDIX A - QUESTIONNAIRE

A 1. Questionnaire sent to Software Accounting Companies

Survey on Pan-European Software Development

1. **Company Name** :
2. **Name (Optional)** :
3. **Type of Company** :
4. **Types of Applications developed** : Payroll Ledgers Stock Control
 Invoicing Sales Order Purchase Orders

5. **Target Platforms:** UNIX NOVELL OS/2
 WIN. NT WIN. 3.X WIN. 95

6. **What design methodologies are you using for developing your products ?** SSADM SUMMIT-D PRINCE
 ORACLE DAFNE MERISE
 IE MEIN SDM

7. **What is your implementation languages ?** V. Basic Oracle Informix
 Visual C++ Sculptor Cobol

8. **Is your Market ?** Worldwide Europe USA only
 UK only Local country
9. **Would you describe any of your products as being Pan-European ?** YES NO
10. **Do you believe its feasible for a financial information software product to be used on a Pan-European basis ?** YES NO Don't Know
11. **Do your applications have these features :** Multicurrency Portability Scalability
 Interoperability User Interface Multi-lingual
12. **When European Monetary Union (EMU) takes place, how do you assess the impact on your products ?** Significant Some No impact
 Don't know
13. **Do you have future plans regarding the European Market ?** YES NO Don't Know

A 2 Analysis of the Results

A2 1 Types of Applications developed

	PAYROLL	LEDGERS	STOCK	INVOICING	SALES	PURCHASE	JOB	LABOUR	FIXED	POINT	OTHERS
			CONTROL	ORDER	ORDER	ORDER	COST.	DISTR.	ASSETS	SALES	
CEDAR DATA			1	1	1	1	1				
ROSS SYSTEMS			1	1	1	1				1	
COMPUTER ASSOCIATES			1	1	1	1	1				
BUSINESS COMPUTER PROJECTS LTD			1	1	1	1					
ATTAR SOFTWARE LTD											1
CARE INTERACTIVE SOFTWARE											1
MOUNTFIELD	1		1	1	1	1	1				1
AXXIA SYSTEMS LTD											1
CAM UK											1
ASPEN SOFTWARE											1
CEM SYSTEMS LTD											1
ALTMAN & ASSOCIATES											1
DELUXE DATA											1
KENILL SYSTEMS PLC	1		1	1	1	1	1				1
GREAT RAINS SOFTWARE	1		1	1	1	1	1			1	
KEWILL OMICRON	1		1	1	1	1	1				
IBSC PUBLIC SERVICES				1	1	1					
FCS COMPUTER SERVICES											1
SAP UK	1		1	1	1	1	1				1
COMPUTER FOUNDATIONS LIMITED	1		1	1	1	1	1				1
JBA	1		1	1	1	1	1				1
DATALINK CHOPRUS LTD	1		1	1	1	1	1				1
COMPUTER SYSTEMS FOR BUSINESS	1		1	1	1	1	1				1
ROSS SYSTEMS (UK) LTD			1	1	1	1	1				
4S INFORMATION SYSTEMS											1

Types of Applications Developed

	PAYROLL	LEDGERS	STOCK CONTROL	INVOICING	SALES ORDER	PURCHASE ORDER	JOB COST.	LABOUR DISTR.	FIXED ASSETS	POINT SALES	OTHERS
AIM COMMERCIAL SYSTEMS LIMITED											1
ACA SYSTEMS											
DST INTERNATIONAL										1	
ABBEY INTERNATIONAL SYSTEMS											1
CONCENSUS					1	1	1				1
BABBAGA SOFTWARE LTD		1	1	1	1	1	1				1
BROOKS ASSOCIATES		1	1	1	1	1	1				1
TUROR PLUS LTD											1
CODA PLC		1				1	1				1
3D SYSTEMS											1
CMG PLC	1										
AGRESSO	1	1	1	1	1	1	1				
ACCOUNTS II SOFTWARE LTD	1	1	1	1	1	1	1				
ORACLE	1	1	1	1	1	1	1				
AJV							1				
ASSIST APPLICATION LTD											1
BERKELEY COMPUTER SERVICES	1	1	1	1	1	1	1	1			
INTERNATIONAL INFORMATION SOL.											1
CAMBELL COMPUTER SERVICES			1	1	1	1	1				
DORSET SOFTWARE SERVICES											1
AEA TECHNOLOGY PLC			1	1	1	1	1				
CADCENTRE LTD											1

A2 2 Target Platforms

	UNIX	NOVELL	OS/2	WIN NT.	WIN 3.x	WIN. 95	DIGITAL OVMS	OS400	IBM M/F	S390	AS400	AXP	AIX	MDOS	IBM MVS
CEDAR DATA	1			1			1								
ROSS SYSTEMS	1						1								
COMPUTER ASSOCIATES	1			1		1					1				
BUSINESS COMPUTER PROJECTS LTD	1	1	1	1	1	1									
ATTAR SOFTWARE LTD				1		1									
CARE INTERACTIVE SOFTWARE	1	1	1	1	1	1									
MOUNTFIELD	1	1	1	1	1	1									
AXXIA SYSTEMS LTD	1			1	1	1									
CAM UK	1			1	1	1									
ASPEN SOFTWARE				1											
CEM SYSTEMS LTD	1			1		1									
ALTMAN & ASSOCIATES	1	1		1	1	1									
DELUXE DATA	1			1	1	1									
KENILL SYSTEMS PLC		1		1		1									
GREAT RAINS SOFTWARE				1	1	1									
KEWILL OMICRON		1		1	1	1									
IBSC PUBLIC SERVICES									1						
FCS COMPUTER SERVICES	1			1	1	1									
SAP UK	1			1	1	1				1					
COMPUTER FOUNDATIONS LIMITED		1		1	1	1									
JBA	1										1				
DATALINK CHOPRUS LTD				1							1				
COMPUTER SYSTEMS FOR BUSINESS LTD	1			1	1	1									
ROSS SYSTEMS (UK) LTD	1			1	1	1							1	1	
4S INFORMATION SYSTEMS	1	1		1	1	1									

Target Platforms

	UNIX	NOVELL	OS/2	WIN NT	WIN 3.x	WIN 95	DIGITAL OVMS	OS400	IBM M/F	S390	AS400	AXP	AIX	MDOS	IBM MVS
AIM COMMERCIAL SYSTEMS LIMITED	1														
ACA SYSTEMS				1	1	1									
DST INTERNATIONAL	1	1	1	1	1	1					1				
ABBEY INTERNATIONAL SYSTEMS	1				1	1									
CONSENSUS				1	1	1									
BABBAGA SOFTWARE LTD	1	1	1	1	1	1									1
BROOKS ASSOCIATES		1	1	1	1	1									1
TUROR PLUS LTD				1	1	1									
CODA PLC	1			1	1	1									
3D SYSTEMS				1	1	1									
CMG PLC															1
AGRESSO	1			1	1	1									
ACCOUNTS II SOFTWARE LTD	1	1	1	1	1	1									
ORACLE	1	1	1	1	1	1									
AJV		1	1	1	1	1									
ASSIST APPLICATION LTD	1	1	1	1	1	1									
BERKELEY COMPUTER SERVICES	1			1	1	1									
INTERNATIONAL INFORMATION SOLUTIONS	1		1	1	1	1				1					
CAMBELL COMPUTER SERVICES															1
DORSET SOFTWARE SERVICES	1	1	1	1	1	1									
AEA TECHNOLOGY PLC	1	1	1	1	1	1									
CADCENTRE LTD	1			1	1	1									

A2.3 What design methodologies are you using for developing your products ?

	SSADM	SUMMIT-D	PRINCE	ORACLE	DAFNE	MERISE	IE	MEIN	SDM	JACKSON	ACS	RAD8	IN-HOUSE	N/A	NONE
CEDAR DATA				1											
ROSS SYSTEMS															1
COMPUTER ASSOCIATES	1														
BUSINESS COMPUTER PROJECTS LTD	1														
ATTAR SOFTWARE LTD														1	
CARE INTERACTIVE SOFTWARE				1											
MOUNTFIELD	1														
AXXIA SYSTEMS LTD													1		
CAM UK	1		1	1					1						
ASPEN SOFTWARE													1		
CEM SYSTEMS LTD														1	
ALTMAN & ASSOCIATES														1	
DELUXE DATA															1
KENILL SYSTEMS PLC															1
GREAT RAINS SOFTWARE															1
KEWILL OMICRON	1														
IBSC PUBLIC SERVICES	1														
FCS COMPUTER SERVICES				1											
SAP UK													1		
COMPUTER FOUNDATIONS LIMITED															1
JBA	1														
DATALINK CHOPRUS LTD	1														
COMPUTER SYSTEMS FOR BUSINESS LTD															1
ROSS SYSTEMS (UK) LTD														1	
4S INFORMATION SYSTEMS	1		1	1				1						1	

What design methodologies are you using for developing your products ?

	SSADM	SUMMIT-D	PRINCE	ORACLE	DAFNE	MERISE	IE	MEIN	SDM	JACKSON	ACS	RAD8	IN-HOUSE	N/A	NONE
AIM COMMERCIAL SYSTEMS LIMITED														1	
ACA SYSTEMS												1			
DST INTERNATIONAL				1											
ABBEY INTERNATIONAL SYSTEMS	1														
CONCENSUS														1	
BABBAGA SOFTWARE LTD															1
BROOKS ASSOCIATES											1				
TUROR PLUS LTD															1
CODA PLC															1
3D SYSTEMS										1					
CMG PLC														1	
AGRESSO															1
ACCOUNTS II SOFTWARE LTD															1
ORACLE				1											
AJV														1	
ASSIST APPLICATION LTD														1	
BERKELEY COMPUTER SERVICES				1											
INTERNATIONAL INFORMATION SOLUT.	1			1											
CAMBELL COMPUTER SERVICES															
DORSET SOFTWARE SERVICES														1	
AEA TECHNOLOGY PLC														1	
CADCENTRE LTD														1	

A2 4 What is your implementation languages ?

	VISUAL BASIC	ORACLE	INFORMIX	VISUAL C++	SCULPTOR	COBOL	DELPHI	PROGRESS	POWERBUILDER	C++	TAL	RPG400	OS/400
CEDAR DATA		1											
ROSS SYSTEMS													
COMPUTER ASSOCIATES				1		1							
BUSINESS COMPUTER PROJECTS LTD								1					
ATTAR SOFTWARE LTD							1						
CARE INTERACTIVE SOFTWARE						1							
MOUNTFIELD			1										
AXXIA SYSTEMS LTD			1										
CAM UK	1	1		1		1							
ASPEN SOFTWARE	1												
CEM SYSTEMS LTD	1		1							1			
ALTMAN & ASSOCIATES				1									
DELUXE DATA						1				1			
KENILL SYSTEMS PLC	1												
GREAT RAINS SOFTWARE													
KEWILL OMICRON				1									
IBSC PUBLIC SERVICES												1	
FCS COMPUTER SERVICES		1											
SAP UK		1		1									1
COMPUTER FOUNDATIONS LIMITED							1						
JBA	1												1
DATALINK CHOPRUS LTD				1									
COMPUTER SYSTEMS FOR BUSINESS LTD							1						
ROSS SYSTEMS (UK) LTD													
4S INFORMATION SYSTEMS				1							1		

What is your implementation languages ?

	VISUAL BASIC	ORACLE	INFORMIX	VISUAL C++	SCULPTOR	COBOL	DELPHI	PROGRESS	POWERBUILDER	C++	TAL	RPG400	OS/400
AIM COMMERCIAL SYSTEMS LIMITED				1									
ACA SYSTEMS	1												
DST INTERNATIONAL				1		1							
ABBAY INTERNATIONAL SYSTEMS				1									
CONCENSUS		1											
BABBAGA SOFTWARE LTD						1							
BROOKS ASSOCIATES							1						
TUROR PLUS LTD	1												
CODA PLC				1									
3D SYSTEMS	1												
CMG PLC	1			1									
AGRESSO				1									
ACCOUNTS II SOFTWARE LTD				1			1						
ORACLE				1									
AJV		1											
ASSIST APPLICATION LTD				1									
BERKELEY COMPUTER SERVICES							1						
INTERNATIONAL INFORMATION SOLUTIONS	1	1	1	1	1	1	1		1	1			
CAMBELL COMPUTER SERVICES							1						1
DORSET SOFTWARE SERVICES	1						1		1	1			
AEA TECHNOLOGY PLC	1	1	1	1									
CADCENTRE LTD										1			

Appendix A - Questionnaire

A2 5 Is your Market ?

	WORDWIDE	EUROPE	USA ONLY	UK ONLY	LOCAL COUNTRY
CEDAR DATA				1	1
ROSS SYSTEMS		1			
COMPUTER ASSOCIATES		1			
BUSINESS COMPUTER PROJECTS LTD		1			
ATTAR SOFTWARE LTD					1
CARE INTERACTIVE SOFTWARE			1		
MOUNTFIELD		1			
AXXIA SYSTEMS LTD					1
CAM UK		1			
ASPEN SOFTWARE			1		
CEM SYSTEMS LTD		1			
ALTMAN & ASSOCIATES			1		
DELUXE DATA		1			
KENILL SYSTEMS PLC		1			
GREAT RAINS SOFTWARE		1			
KEWILL OMICRON					1
IBSC PUBLIC SERVICES		1			
FCS COMPUTER SERVICES		1			
SAP UK		1			
COMPUTER FOUNDATIONS LIMITED					1
JBA		1			
DATALINK CHOPRUS LTD			1		
COMPUTER SYSTEMS FOR BUSINESS LTD		1			
ROSS SYSTEMS (UK) LTD		1			
4S INFORMATION SYSTEMS		1			
AIM COMMERCIAL SYSTEMS LIMITED					1
ACA SYSTEMS					1
DST INTERNATIONAL		1			
ABBAY INTERNATIONAL SYSTEMS		1			
CONCENSUS		1			
BABBAGA SOFTWARE LTD			1		
BROOKS ASSOCIATES			1		
TUROR PLUS LTD		1			
CODA PLC		1			
3D SYSTEMS					1
CMG PLC			1		
AGRESSO		1			
ACCOUNTS II SOFTWARE LTD					1
ORACLE		1			
AJV					1
ASSIST APPLICATION LTD		1			
BERKELEY COMPUTER SERVICES					1
INTERNATIONAL INFORMATION SOLUTIONS		1			

CAMBELL COMPUTER SERVICES				1	
DORSET SOFTWARE SERVICES	1				
AEA TECHNOLOGY PLC	1				
CADCENTRE LTD	1				

A2 6 Would you describe any of your products as being Pan-European

	YES	NO
CEDAR DATA	1	
ROSS SYSTEMS	1	
COMPUTER ASSOCIATES	1	
BUSINESS COMPUTER PROJECTS LTD		1
ATTAR SOFTWARE LTD	1	
CARE INTERACTIVE SOFTWARE	1	
MOUNTFIELD	1	
AXXIA SYSTEMS LTD		1
CAM UK	1	
ASPEN SOFTWARE	1	
CEM SYSTEMS LTD	1	
ALTMAN & ASSOCIATES	1	
DELUXE DATA	1	
KENILL SYSTEMS PLC	1	
GREAT RAINS SOFTWARE	1	
KEWILL OMICRON		1
IBSC PUBLIC SERVICES	1	
FCS COMPUTER SERVICES	1	
SAP UK	1	
COMPUTER FOUNDATIONS LIMITED		1
JBA	1	
DATALINK CHOPRUS LTD	1	
COMPUTER SYSTEMS FOR BUSINESS LTD	1	
ROSS SYSTEMS (UK) LTD	1	
4S INFORMATION SYSTEMS	1	
AIM COMMERCIAL SYSTEMS LIMITED		1
ACA SYSTEMS		1
DST INTERNATIONAL	1	
ABBAY INTERNATIONAL SYSTEMS		1
CONCENSUS	1	
BABBAGA SOFTWARE LTD		1
BROOKS ASSOCIATES	1	
TUROR PLUS LTD	1	
CODA PLC	1	
3D SYSTEMS		1
CMG PLC		1
AGRESSO	1	
ACCOUNTS II SOFTWARE LTD		1
ORACLE	1	
AJV	1	
ASSIST APPLICATION LTD	1	
BERKELEY COMPUTER SERVICES	1	
INTERNATIONAL INFORMATION		1
CAMBELL COMPUTER SERVICES		1

DORSET SOFTWARE SERVICES		1
AEA TECHNOLOGY PLC	1	
CADCENTRE.LTD	1	

A2 7 Do you believe is feasible for a financial information software product to be used on a Pan-European basis

	YES	NO	Don't Know
CEDAR DATA		1	
ROSS SYSTEMS		1	
COMPUTER ASSOCIATES		1	
BUSINESS COMPUTER PROJECTS LTD			1
ATTAR SOFTWARE LTD			1
CARE INTERACTIVE SOFTWARE		1	
MOUNTFIELD		1	
AXXIA SYSTEMS LTD		1	
CAM UK		1	
ASPEN SOFTWARE		1	
CEM SYSTEMS LTD			1
ALTMAN & ASSOCIATES			1
DELUXE DATA		1	
KENILL SYSTEMS PLC			1
GREAT RAINS SOFTWARE		1	
KEWILL OMICRON		1	
IBSC PUBLIC SERVICES		1	
FCS COMPUTER SERVICES		1	
SAP UK		1	
COMPUTER FOUNDATIONS LIMITED			1
JBA		1	
DATALINK CHOPRUS LTD		1	
COMPUTER SYSTEMS FOR BUSINESS LTD		1	
ROSS SYSTEMS (UK) LTD		1	
4S INFORMATION SYSTEMS			1
AIM COMMERCIAL SYSTEMS LIMITED		1	
ACA SYSTEMS			1
DST INTERNATIONAL		1	
ABBEY INTERNATIONAL SYSTEMS		1	
CONCENSUS		1	
BABBAGA SOFTWARE LTD			1
BROOKS ASSOCIATES		1	
TUROR PLUS LTD		1	
CODA PLC		1	
3D SYSTEMS			1
CMG PLC		1	
AGRESSO		1	
ACCOUNTS II SOFTWARE LTD			1
ORACLE		1	

AJV	1		
ASSIST APPLICATION LTD	1		
BERKELEY COMPUTER SERVICES	1		
INTERNATIONAL INFORMATION SOLUTIONS	1		
CAMBELL COMPUTER SERVICES	1		
DORSET SOFTWARE SERVICES	1		
AEA TECHNOLOGY PLC	1		
CADCENTRE LTD	1		

A2 8 Do your applications have these features ?

	MULTICUR.	PORTABILITY	SCALEABILITY	INTEROPER.	USER INTERF.	MULTILINGUAL
CEDARATA	1	1	1	1	1	1
ROSS SYSTEMS	1	1	1	1	1	1
COMPUTER ASSOCIATES	1	1	1	1	1	1
BUSINESS COMPUTER PROJECTS LTD		1	1		1	
ATTAR SOFTWARE LTD			1		1	1
CARE INTERACTIVE SOFTWARE	1	1	1	1	1	1
MOUNTFIELD	1	1	1		1	1
AXXIA SYSTEMS LTD	1	1	1	1	1	1
CAM UK		1	1	1	1	1
ASPEN SOFTWARE			1		1	1
CEM SYSTEMS LTD		1	1		1	1
ALTMAN & ASSOCIATES		1	1	1	1	
DELUXE DATA	1	1	1		1	1
KENILL SYSTEMS PLC	1					
GREAT RAINS SOFTWARE	1	1	1	1	1	1
KEWILL OMICRON	1	1	1		1	
IBSC PUBLIC SERVICES	1	1	1	1	1	1
FCS COMPUTER SERVICES	1	1	1		1	1
SAP UK	1	1	1	1	1	1
COMPUTER FOUNDATIONS LIMITED			1	1	1	
JBA	1				1	1
DATALINK CHOPRUS LTD	1	1	1	1	1	1
COMPUTER SYSTEMS FOR BUSINESS	1	1	1	1	1	
ROSS SYSTEMS (UK) LTD	1	1	1	1	1	1
4S INFORMATION SYSTEMS						1
AIM COMMERCIAL SYSTEMS LIMITED		1	1			
ACA SYSTEMS	1	1	1	1		
DST INTERNATIONAL	1	1	1	1	1	
ABBAY INTERNATIONAL SYSTEMS	1	1	1		1	1
CONCENSUS	1	1	1			1
BABBAGA SOFTWARE LTD	1	1			1	
BROOKS ASSOCIATES	1		1		1	1
TUROR PLUS LTD					1	1
CODA PLC	1	1	1	1	1	1
3D SYSTEMS						
CMG PLC						

AGRESSO	1	1	1	1	1	1
ACCOUNTS II SOFTWARE LTD	1	1	1	1		
ORACLE	1	1	1			1
AJV	1	1	1		1	1
ASSIST APPLICATION LTD	1	1	1		1	1
BERKELEY COMPUTER SERVICES	1	1	1	1	1	1
INTERNATIONAL INFORMATION	1				1	
CAMBELL COMPUTER SERVICES	1	1	1	1	1	1
DORSET SOFTWARE SERVICES	1	1	1	1	1	1
AEA TECHNOLOGY PLC	1		1		1	1
CADCENTRE LTD		1	1		1	1

A2 9 When European Monetary Union (EMU) takes place, how do you assess the impact on your products ?

	SIGNIFICANT	SOME	NO IMPACT	DON'T KNOW
CEDAR DATA		1		
ROSS SYSTEMS		1		
COMPUTER ASSOCIATES		1		
BUSINESS COMPUTER PROJECTS LTD	1			
ATTAR SOFTWARE LTD			1	
CARE INTERACTIVE SOFTWARE			1	
MOUNTFIELD		1		
AXXIA SYSTEMS LTD	1			
CAM UK			1	
ASPEN SOFTWARE			1	
CEM SYSTEMS LTD				1
ALTMAN & ASSOCIATES			1	
DELUXE DATA		1		
KENILL SYSTEMS PLC		1		
GREAT RAINS SOFTWARE		1		
KEWILL OMICRON	1			
IBSC PUBLIC SERVICES		1		
FCS COMPUTER SERVICES		1		
SAP UK	1			
COMPUTER FOUNDATIONS LIMITED		1		
JBA		1		
DATALINK CHOPRUS LTD	1			
COMPUTER SYSTEMS FOR BUSINESS LTD	1			
ROSS SYSTEMS (UK) LTD		1		
4S INFORMATION SYSTEMS		1		
AIM COMMERCIAL SYSTEMS LIMITED	1			
ACA SYSTEMS		1		
DST INTERNATIONAL		1		
ABBAY INTERNATIONAL SYSTEMS		1		
CONCENSUS		1		
BABBAGA SOFTWARE LTD		1		

BROOKS ASSOCIATES		1		
TUROR PLUS LTD		1		
CODA PLC				1
3D SYSTEMS		1		
CMG PLC		1		
AGRESSO			1	
ACCOUNTS II SOFTWARE LTD		1		
ORACLE				1
AJV			1	
ASSIST APPLICATION LTD				1
BERKELEY COMPUTER SERVICES			1	
INTERNATIONAL INFORMATION SOLUTIONS				1
CAMBELL COMPUTER SERVICES				1
DORSET SOFTWARE SERVICES		1		
AEA TECHNOLOGY PLC				1
CADCENTRE LTD		1		

A2 10 Do you have future plans regarding the European Market ?

	YES	NO	DO NOT KNOW
CEDAR DATA	1		
ROSS SYSTEMS	1		
COMPUTER ASSOCIATES	1		
BUSINESS COMPUTER PROJECTS LTD	1		
ATTAR SOFTWARE LTD	1		
CARE INTERACTIVE SOFTWARE	1		
MOUNTFIELD	1		
AXXIA SYSTEMS LTD		1	
CAM UK	1		
ASPEN SOFTWARE	1		
CEM SYSTEMS LTD	1		
ALTMAN & ASSOCIATES	1		
DELUXE DATA	1		
KENILL SYSTEMS PLC	1		
GREAT RAINS SOFTWARE	1		
KEWILL OMICRON	1		
IBSC PUBLIC SERVICES	1		
FCS COMPUTER SERVICES	1		
SAP UK	1		
COMPUTER FOUNDATIONS LIMITED		1	
JBA	1		
DATALINK CHOPRUS LTD	1		
COMPUTER SYSTEMS FOR BUSINESS LTD	1		
ROSS SYSTEMS (UK) LTD	1		
4S INFORMATION SYSTEMS	1		
AIM COMMERCIAL SYSTEMS LIMITED		1	
ACA SYSTEMS		1	

DST INTERNATIONAL	1		
ABBAY INTERNATIONAL SYSTEMS			1
CONCENSUS		1	
BABBAGA SOFTWARE LTD			1
BROOKS ASSOCIATES	1		
TUROR PLUS LTD	1		
CODA PLC	1		
3D SYSTEMS		1	
CMG PLC	1		
AGRESSO	1		
ACCOUNTS II SOFTWARE LTD		1	
ORACLE			1
AJV		1	
ASSIST APPLICATION LTD	1		
BERKELEY COMPUTER SERVICES	1		
INTERNATIONAL INFORMATION SOLUTIONS	1		
CAMBELL COMPUTER SERVICES		1	
DORSET SOFTWARE SERVICES	1		
AEA TECHNOLOGY PLC			1
CADCENTRE LTD	1		

A 3 Companies Participated in the Survey

Shaped Companies are those answered back

1. JD Enwards
2. Exact Software
3. Exchequer Software
4. FourFront
5. Great Plains Software
6. JBA Software Products
7. Kalamazoo Computer solutions
8. Kewill-Omicron
9. Lawson Software
10. MDIS-McDonell Information Systems
11. NSC Programming
12. OpenAccounts
13. Oracle
14. Pegasus Software
15. Propath Software
16. ROCC Computers
17. Ross Systems
18. SAP (UK)
19. Software AG
20. Wyatt-Lowe Associates
21. Baddow Hall Group
22. Boole & Babbage Europe
23. Chorus Software
24. CODA Group
25. Computer Foundations
26. Computer Systems For Business

27. Accounts II Software
28. Agresso
29. Cedardata
30. Computer Associates
31. Software Ltd
32. 3D Systems
33. 3L Ltd
34. 4S Information System Ltd
35. 4S Systems Ltd
36. 7E Communications Ltd
37. AAH Mediel Ltd
38. Abacus Software Ltd
39. Abbey Information systems Ltd
40. ABLAC Learning Works Ltd
41. ACA Systems
42. The Accountancy House Consul.
43. Ace Microsystems Ltd
44. ACK Data
45. Acuity Management Systems Ltd
46. Acxiom UK Ltd
47. Adile Consultancy
48. Admiral Plc
49. ADNET Ltd
50. ADP-GSI Logistics & Distrib.
51. Advent Publishing Systems Ltd
52. AEA Technology Plc
53. Aegis Systems Ltd
54. Affirm Ltd
55. AIM Commercial Systems Ltd
56. AJV
57. Aldex Software
58. Allen Software products
59. ALLM Systems and Marketing
60. Alpha-Comp Computer Services
61. Alphameric Broadcast Solutions
62. Alternative systems Technology
63. Altam & Associates
64. Amethyst Business Computer
65. Amida Ltd
66. AMS Computing Ltd
67. AnaData Ltd
68. Analysys Ltd
69. Anchor Computer System Ltd
70. And Software Ltd
71. Anite Systems Ltd
72. Answers (Research) Ltd
73. Apak Systems Ltd
74. Applied Communications Ltd
75. Applied Network Solutions
76. APT Solutions Ltd
77. Aptech Ltd
78. Aran Ltd
79. Arcontech Ltd
80. Arena Software Ltd
81. Arete Software Ltd
82. ARPRO Consultants

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83. Artificial Intelligence Appl.
 84. ASGI Ltd
 85. Aspen Software - IT Consult.
 86. Assist Applications Ltd
 87. Associated Knowledge Systems
 88. Atlandic Information Systems
 89. ATMS Ltd
 90. Attar Software
 91. Audatex (UK) Ltd
 92. Automated Training Systems
 93. Axion Associates Ltd
 94. Axxia Systems Ltd
 95. Babbage Software Ltd
 96. BAGG Ltd
 97. Harvey Baker & Partners
 98. BEM Datasystems
 99. Benchmark:IT Training,Hardware
 100. Beresford Ltd
 101. Berkeley Computer Services
 102. Beta Micro Services
 103. BISS Ltd
 104. BMS Technology
 105. Bond Associates Ltd
 106. City of Bradford Council
 107. Brandt Computer Systems Ltd
 108. BRM
 109. Broadgate Software & Systems
 110. Brooks Associates
 111. Andrew Brown Associates
 112. Business Computer Projects
 113. CACI Ltd
 114. CADCentre
 115. CAM Systems
 116. CAM UK
 117. Cambridge Consultants Ltd
 118. Cambridge Online Systems
 119. Campbell Lee Computer Services
 120. Care Interactive Software Plc
 121. CEM Systems Ltd
 122. Centreline 2000 Corp
 123. Cerrus Systems Ltd
 124. CGI Ltd
 125. CGRAM Software
 126. Chase Computer Services
 127. Chevin Software Engineering
 128. Chorus Software Ltd
 129. CHP Consulting Ltd
 130. Cimtek Ltd
 131. Cincom Systems (UK)
 132. City Systems (UK) Ltd
 133. Citymax Integrated Information
 134. CME Systems
 135. CMG UK Ltd
 136. Command Software Systems
 137. Compaddress
 138. Computer House

-
- 139.Computeraid Services
 - 140.Computer in Personnel
 - 141.Comshare Ltd
 - 142.Consensus Information
 - 143.CSI Ltd
 - 144.Database Solutions
 - 145.Databorough Ltd
 - 146.Dataware Technologies Ltd
 - 147.Datel Technology
 - 148.Decision Graphics Ltd
 - 149.Delcan International Plc
 - 150.Deluxe Data International
 - 151.Digitus Ltd
 - 152.Dorset Software Services
 - 153.DP Advisers
 - 154.DST International
 - 155.ECsoft Synapse
 - 156.Ethitec
 - 157.FCS
 - 158.Fraser Williams (Data Systems)
 - 159.Fraser Williams Logistics Ltd
 - 160.Intelligent Networks
 - 161.Interlink
 - 162.International business systems
 - 163.International Informatics sol.
 - 164.Kingson-SCL Ltd
 - 165.Knowledge Group
 - 166.Link Associates
 - 167.LIS
 - 168.Logiciel Systems (UK)
 - 169.MF Systems (Meta Four)
 - 170.Midland Software
 - 171.Mountfield Software
 - 172.MSS International Ltd
 - 173.Newell & Budge Ltd
 - 174.Origin UK
 - 175.PA Consulting Group
 - 176.Pacific Associates
 - 177.Pan European(TutorPro)
 - 178.Parity Solutions
 - 179.RCP Consultants
 - 180.Scomag Ltd
 - 181.Strategic Solutions
 - 182.Total Systems Plc

A 4 Companies useful information

COMPANY	TELEPHONE	FAX	CONTACT PERSON	DEVELOPMENT STAFF
4s Information Systems Ltd.	001539-563091	001539-562475	Sydney Steward, Managing Director	7
Abbey Information Systems Ltd.	01306-745600	01306-745602	Ian Walker, Sales Marketing Director	10
AEA Technology Plc	01235-435555	01235-432859	J.Baldwin	26
AIM Commercial Systems Ltd.	01482-326971	01482-228465	Ms Sharon Milner, Marketing Controller	34
AJV	01787-28149	01787-282149	J.V.Smith, Owner	2
Altam & Associates	01937-541400	01937541500	Mark Altman, Director	5
Aspen Software - IT Consultancy	0118-9863800	0118-9753396	Neil Smith, Partner, Business Develop.	5
Assist Application Ltd.	01908-543323	01908-543324	Eric Malcomson, Managing Director	4
Attar Software	01942-608844	01942-601991	David Isherwood, Marketing Director	20
Axxia Systems Ltd	01734-602602	01734-602600	Doug McLachlan-Developer Director	10
Babbage Software Ltd	01803-864328	01803-867456		2
Berkeley Computer Services Ltd	0141-3320891	0141-3339300	Evelyn Kirkpatrick, Training Manager	15
Brooks Associates	01452-770060	01452-770078	R.K. Brooks, Partner	
Business Computer Projects ltd.	0161-4808589	0161-4807655	Brian Preece, Senior Director	17
Centre Ltd.	01223-556655	01223-556666		50
CAM UK	01604-259033	01604-39043	Chris Bowyer, Sales Director	173
Campbell Lee Computer Services	01324-420024	01224-633864	Iain Gibb, Technical Director	50
Care Interactive Software Plc.	01734-575521	01734-503196	Elian Johnson, Sales&Market. Manager	18
CEM Systems Ltd.	01232-456767	01232-454535	David Morrison, support Manager	10
CMG UK Ltd	0171-2330288	0171-2228792	Ms Suise Ashenden, Marketing Conslt.	398
Consensus Information Technol.	01625-537777	01625-539621	Gerard Lennox, Managing Director	15
Deluxe Data International	01928-791791	01928-718177	John Priestley, Sales&Market. Director	180
Dorset Software Series	01202-660886	01202-660904	Miss Nicole Hayward, Marketing Assist.	20

DST International	0181-3905000	0181-3907000	Terry McCann, Director	250
FCS Computer Services Ltd.	01438-317731	01438-316222	Martin Drake, Sales Director	29
International Business Systems International Informatics Solution	01635-30808	01635-32502		53
Mountfield Software Ltd.	01753-735500	01753-735501	Umen Bewtra, Managing Director	300
Pan European Courseware Ltd. CSI Ltd.	01424-441144	01424-432627	Julian Divett, Account Manager	50
Chase Computer Services Cedardata Plc.	01460-234232	01460-234679	P.A Turner, Managing Director	8
Ross Systems (UK) Ltd.	0171-4593801	0171-4593803	Pat Gonsalves	
Computer Associates Kewill Omicron		0181-9498723	Graham Wallis, Deputy Manag. Director	
SAP UK		1443-482715		
Computer Foundation Limited	01753-679252	01753-679608	James Jones	
JBA Software Products	01932-248328	01932-248328	V. Mumes	
Computer Systems for Business CODA Plc.	0181-8182940	0181-8182990	Trevor Solomon	
Agresso	01206-541455	01206-761930		
Accounts II Software Ltd.	01527-496200	01527-496255	Paul Loud	
Oracle	01753-71100	01753-711010		
Great Plains Software	01423-509999	01423-530527		
Chorus Software	0118-9510055	0118-9510066	IsLfaq Is-haq	
Wyatt-Lowe Associates	0181-7423737	0181-7428697		
	0118-9240000	0118-9243000		
	01784-898130	01784-898515		
	01271-46738	01271-79250		
	01442-247372	01442-64447		

APPENDIX B - European Information Technology Observatory (EITO)

The European Information Technology Observatory (EITO) is the establishment yearbook for the information and communications technology (ITC) industry in Europe. Since its launch in 1993 the EITO has set the standard for market analysis and statistics in Europe.

From the very beginning the EITO has been strongly supported by the Directorate General III Industry of the European Commission, and since 1995 by the Directorate for Science, Technology and Industry of the OECD in Paris. The objective of the EITO is to provide an extensively overview of the European market for information and communications technology as a service to this industry.

All the information of EITO is up-to-date and valid. The following graphs are some statistics from the last Update of EITO, the EITO 1996 that includes and the forecast trend for 1997.

	1993/1994	1994/1995	1995/1996	1996/1997
Austria	7	9	8.8	8.2
Belgium	4.4	3.9	5.9	5.8
Denmark	8.7	8.9	6.6	5.1
Finland	6.5	12.7	8.8	8.1
France	2.8	5.9	5.8	7.5
Germany	5.5	7.2	6.4	7.4
Greece	9.8	11.5	11.8	14.3
Ireland	5.3	6.4	5.6	5.1
Italy	2.1	4.6	4	5.2
Netherlands	8.1	7.7	7.7	6.9
Norway	6.8	9.8	7.4	6.5
Portugal	4.1	6.3	7.2	7.1
Spain	1.2	8.5	7.7	8.2
Sweden	8.2	11.8	6.3	5.2
Switzerland	6.6	6.9	7.2	7.8
UK	7.4	9.4	8.2	7
Western Europe	5.3	7.4	6.6	6.9

Table B 1 : Western European IT Market, Value Growth by Country in %

	1993/1994	1994/1995	1995/1996	1996/1997
Large-scale systems	-9.1	-6.5	-4.4	-1
Medium-scale systems	-2.5	2.5	4.1	5.2
Small-scale systems	3.5	1.4	3.3	6.5
Workstations	11.3	13.7	11.3	10.4
Personal computers	15.1	14.4	10.5	9.3
PC printers	7.7	16.1	6.5	3.7
LAN hardware	22.5	21.7	18.4	12.3
Datacom equipment	-2.9	2.3	1.9	2.4
Office equipment	-0.5	0	0.7	1.3
Total IT hardware	5.4	7.5	6.2	6.2
Software products	8.1	11	8.8	9.6
Professional services	7	8.7	8.6	8.7
Processing services	4	2.1	2.1	2.9
Network services	8.6	14.2	15.7	14.6
Services	6.2	7.3	7.4	7.7
Support services	-1.7	0.6	2.2	3.1
Total IT market	5.3	7.4	6.6	6.9
Public network equipment	1.5	-1.4	-4.7	-2.7
Private network equipment	9.8	7.9	7.2	8
Telecom. services	9.5	10.5	10.3	10.4
Total telecom. market	8.7	9	8.6	9.1
Total ICT market	7.1	8.2	7.6	8

Table B 2 : Western European ICT Market, Value Growth by Product Segment in %

	1995/1996	1996/1997
Hardware	5.6	7.3
Software Products	7.3	7.6
Services	9.4	9.9
Support services	1.7	2
Public Tel. Equip.	-6.6	-4.7
Private Tel. Equip.	7.3	6.8
Telecom Serv.	11.7	11.2
Total ICT Market	8.1	8.6

Table B 3 : Germany ICT Market Value growth by product Segment in % 1996-97

	1995/1996	1996/1997
Hardware	6.7	7.9
Software Products	8.3	11.9
Services	5.2	6.2
Support services	1.5	3.3
Public Tel. Equip.	-3.2	-3.8
Private Tel. Equip.	9.3	10.2
Telecom Serv.	7.6	8.5
Total ICT Market	6.4	7.7

Table B 4 : France ICT Market Value growth by product Segment in % 1996-97

	1995/1996	1996/1997
Hardware	8.1	6
Software Products	10.9	10.1
Services	9.1	7.7
Support services	3.6	4.4
Public Tel. Equip.	2.1	4.2
Private Tel. Equip.	5.2	6.7
Telecom Serv.	12	12.4
Total ICT Market	9.3	9.1

Table B 5 : UK ICT Market Value growth by product Segment in % 1996-97

	1995/1996	1996/1997
Hardware	3	4.3
Software Products	5.5	6.4
Services	6.3	7.3
Support services	-0.7	0.8
Public Tel. Equip.	4.9	0
Private Tel. Equip.	4.2	4.3
Telecom Serv.	8.8	7.7
Total ICT Market	6.4	6.1

Table B 6 : Italy ICT Market Value growth by product Segment in % 1996-97

	1995/1996	1996/1997
Germany	6.4	7.4
France	5.8	7.5
UK	8.2	7.0
Italy	4.0	5.2
Spain	7.7	8.2
Benelux	7.1	6.5
Scandinavia	7.0	5.9
W.Europe	6.6	6.9

Table B 7 : Western Europe IT Market Value Growth by country in 1996-97

	1995/1996	1996/1997
Hardware	6.2	6.2
Software Products	8.8	9.6
Services	7.4	7.7
Support services	2.2	3.1
Public Tel. Equip.	-4.7	-2.7
Private Tel. Equip.	7.8	8.0
Telecom Serv.	10.3	10.4
Total ICT Market	7.6	8.0

Table B 8 : Western Europe ICT Market Value Growth by Product Segment in % 1996-97

	IT	Telecom
Europe	6.3	9
US	8.4	1.9
Japan	4.9	6.3
Rest of World	13	7.2
World	8	6.4

Table B 9 : World Annual IT Markets Average Annual Growth in % 1995-97

APPENDIX C - Banking Sectors

These tables and graphs are based on:

1. Banking in the EU and Switzerland 1994
2. Financial Management Report; 'I mercati finanziari internazionali'
 - IPSOA "Il giornale della banca" 1993
 - Mondadori, Banca d'Italia "Assemblea generale ordinaria dei partecipanti" 1995
3. "European Banking and capital markets", A.Andersen 1993
4. European Information Technology Observatory 1996 (EITO 96)

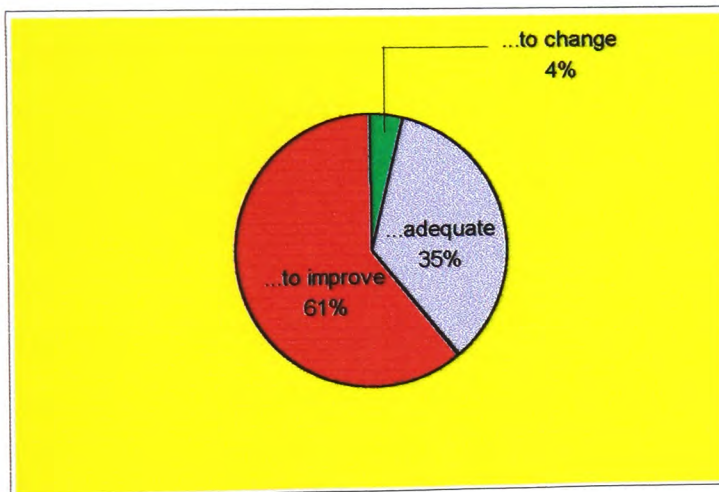


Figure C 1 : Application and Software Adequacy

	Present			Forecast			Trend		
	In-house	Software packages	Custom	In-house	Software packages	Custom	In-house	Software packages	Custom
France	78	11	11	59	41	0	-19	30	-11
Germany	26	38	36	37	52	11	11	14	-25
UK	47	34	18	30	64	6	-17	30	-13
Italy	26	58	16	23	62	15	-3	4	-1
Spain	53	22	25	59	29	12	6	8	-14

Table C 1 : Project Development Models in %

APPENDIX D - ABBREVIATIONS

PEFIS	Pan European Financial Information System
EITO	European Information Technology Observatory
I.T	Information Technology
E.U	European Union
R.o.W	Rest of World
IASC	International Accounting Standards Committee
IFAC	International Federation of Accountants
FEE	Federal des Experts Comtables Europeens
E.S	European States
ECU	European Currency Unit
CADCAM	Computer aided design and manufacturing
PC	Personal Computer
LAN	Local Area Network
GUIs	Graphical User Interface
OSI	Open Systems Interconnection
WAN	Wide Area Network
FM	Financial Market
EMI	European Monetary Institute
ECB	European Central Bank
ICT	Information and Communication Technology
DB	Database
ATM	Asynchronous Transfer Mode
ISDN	Integrated Services of Digital Network
ESCB	European System of Central Banks
RTGS	Real Time Gross Settlement
TARGET	Trans-European Automated Real Time Gross settlement Express Transfer
IAAA	Inter-American Accounting Association

CAPA	Confederation of Asian and Pacific Accountants
UEC	Union Europeenne des Experts Compatables
GATT	General Agreement of Tariffs and Trade
SQL	Standard Query Language
SNMP	Simple Network Management Protocol
UTC	Unicode Technical Committee
GDI	Graphics Device Interface
ODBC	Open Database Connectivity
DLL	Dynamic Link Library

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